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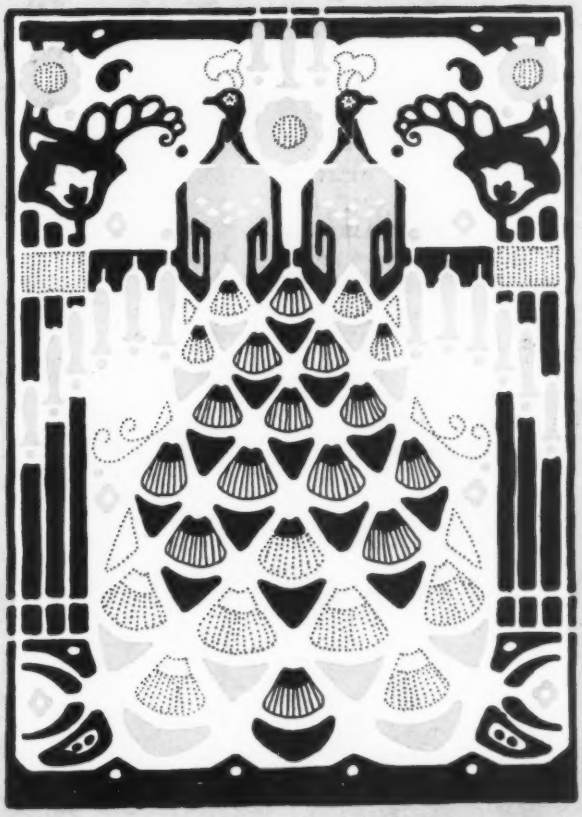

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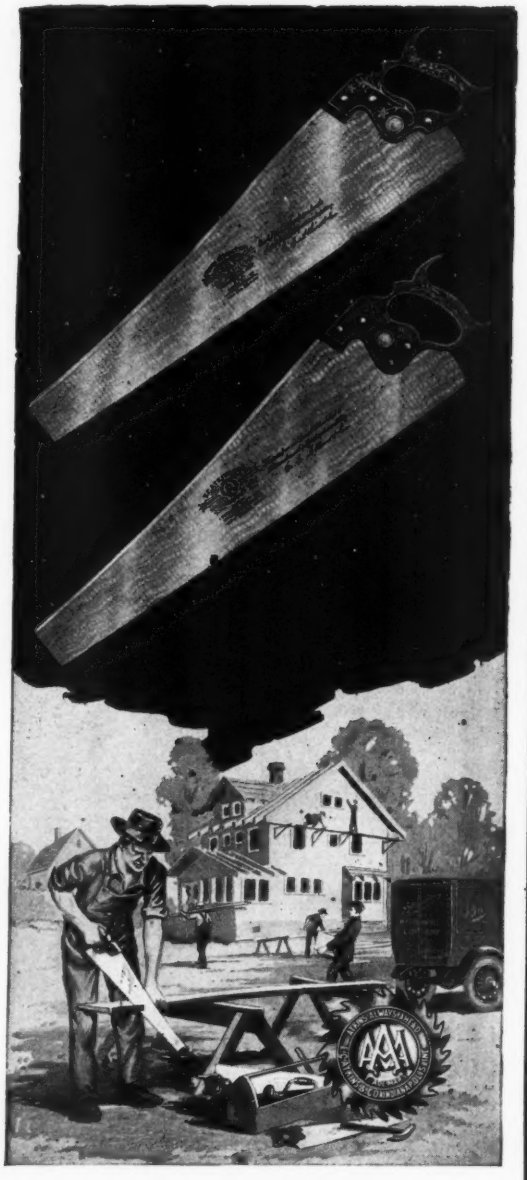

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INDUSTRIAL-ARTS MAGAZINE

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Trade and Industrial Education and Industrial Arts

Their Respective Aims, Materials and Methods

Prof. D. J. MacDonald University of Cincinnati

IN view of the fact that considerable misunderstanding prevails among teachers and administrators in the respective fields of Trade and Industrial Education and Industrial arts as to the specific service each is supposed to render, I have deemed it fitting to attempt to clear away the most prominent causes of differences. One thing is certain, any contribution I may be able to make in this direction will be conducive to greater efficiency among the members of the two groups since the time and energy now consumed in carrying on needless, and oftentimes fruitless, discussions may be more largely given over to constructive work.

As intimated in the title of this article, I wish to consider the topic under three main headings, namely, first, Aims or Objectives, second, The Materials Worked With, i. e., Pupils, Subject Matter and Equipment, and third, Methods of Administration and Teaching Employed. It need not be pointed out to the readers of this magazine that consideration might also well be given to other aspects of the subject. My main objective will have been achieved, however, when I have considered in a broad way merely the main points.

It is none too widely or well understood, unfortunately, that the framers of the Smith-Hughes Law, as well as those who have had its administration in hand, had in mind affording and providing appropriate assistance of educational character to employed, rather than to unemployed, persons. At first glance this point of view seems to present no outstanding difficulties. One might say that theoretically it seems perfectly clear and quite possible of being administered easily and acceptably; but when it comes to putting the idea into practice, experienced school administrators have found it—in fact, are still finding it—not only difficult of comprehension but practically impossible to administer. And so far as I can interpret the signs of the times, this is largely for one reason, namely, that they have to a very large degree insisted upon trying to make it fit the needs of those for whom it was never primarily intended by its framers and executors. That is to say, they have tried to apply it to the needs of pupils already in school. Were time and space available, plenty of evidence could be cited in support of this statement. But since such is not the case, it will suffice to refer the reader to the usual evening and industrial classes as conducted in different parts of the country. It is too well known to require or even warrant the statement here that, in the main, the unsatisfactoriness of our evening industrial school work is largely due to administrative inefficiency. Quite uniformly it may be asserted that those in charge of such work have insisted upon employing traditional means of advertising and administering it, evidently forgetful or ignorant of the fact—one hesitates to say which—that they are dealing with an entirely different type of pupil and that, therefore, an entirely different method of administration and teaching must be employed.

Aims or Objectives.

Let us say then that the primary aim of trade and industrial education is increased vocational efficiency; but at the same time, let us not forget the important aspect of the work as expressed in the phrase, "to increase the civic and vocational intelligence." In other words, while the first aim is to increase the employee's ability as a craftsman, inseparably associated with this is that of helping him to become a better citizen. It will be noted at once that the aim or objective—even though two-fold in character—is undeniably specific, since it has to do with "building up workers in or on their jobs." It might be said that remoteness does not at all enter as a factor. Neither does indirectness play a part. The aim is clear, direct, and specific, in fact, so clear, so direct, and so specific, that one might be justified in saying that "the wayfarer, though a fool, need not err therein."

When we turn to the industrial arts field proper, we find quite different conditions. In the first place, it may be said without fear of contradiction that the aim here is general rather than specific. Undoubtedly, if a poll were taken of the industrial arts teachers of the whole country, it would be found that 99 per cent of them are not trying to turn out mechanics. In reality such it is not, nor was it ever intended to be the pur-

pose of this kind of work, despite the efforts of a limited few in the field. Incidentally, I may add that where the efforts just referred to have been put forth at all vigorously, they have merely resulted in giving the undiscriminating and more or less meddlesome public an entirely wrong conception of the real purpose of the work and, as a direct consequence, have materially injured, in restricted localities, not only industrial arts, but the entire educational movement. Industrial arts has been, is, and should continue to be, a very definite and important part of the general education scheme, and though it deals exclusively with manual activities, its objective, briefly stated, may be said to be "knowledge of, rather than intimate acquaintance with," such manual activities. I like to consider the objective of industrial arts work in terms of appreciation rather than in terms of development of skill. Thus, in a very decided manner, it provides the opportunity for acquiring an appreciation of the meaning

(a) of tool using and the problems connected therewith;

(b) of material handled for definite purposes, for example, to make it serve specific ends;

(c) of planning jobs and getting them done on time, i. e., thinking constructively and executing satisfactorily;

(d) of a hand- and machine-made world;

(e) of accuracy and neatness in a new and vitally important sense.

To repeat, these appreciations, rather than the acquisition of a large amount of specific and usable knowledge in any one field, together with the accompanying skill and the intelligence to use such knowledge, is what industrial arts should endeavor to accomplish. And may I add, that to the extent that it accomplishes these worth-while objectives, it becomes just as definitely cultural in value as any other subject in the course of study. So much for the outstanding objectives of such work.

We may now profitably consider for a moment some less important ones. Among these the one that stands out most prominently is that of providing opportunity to sample or try out several different lines of manual activities. Such service is usually referred to as "educational guidance of vocational intent." As to the reason for such experimenting being carried on largely in the field of wood-working, when, as is well known, metal work as such has for years played an increasingly larger part in the world's industrial program, the writer has never felt entirely clear, particularly when leaders in the field have more recently maintained that vocational sampling is one of the important objectives. Surely, "hewers of wood" do not predominate in the world today. But, be that as it may, it will be observed that even this aim is general, so far as any one vocation is concerned, for, as a rule, the pupils are permitted to sample from three to six, or more, different trades. The only sense, therefore, in which this aim may be considered specific is as a selective force or agency. The one other purpose of industrial arts work I shall mention is what is usually referred to as the recreational one. I refer to that manual ability one acquires which ever after serves him in a thousand and one ways, both within and outside the home. Because of this he knows how certain objects are made and how to set about repairing many of them. Tools and their various uses are not, as would otherwise be true, entirely outside his experience. Nor is this ability to serve limited to himself; for, very often because of it, he can increase the happiness of others as well.

If, now, we compare these two types of education from the standpoint of their respective contributions in the way of building up desirable attitudes toward life and its problems, and of helping to establish or develop abilities which are indispensable to success, we shall find that while both contribute, in one case the contribution is general, in the other it is undeniably specific or limited in application to one vocation or occupation. That is to say, in trade and industrial work, the pupil is helped to acquire knowledge and skill in one trade or is taught to use his knowledge and skill wisely in that distinct line of activity; while in industrial arts, he is helped to acquire a certain amount of trade knowledge in different fields, likewise, a limited amount of skill, but the emphasis is placed upon strengthening his ideals as to what constitutes accuracy, neatness, ability to think straight, punctuality, industry, dependability, etc., in the whole field of manual activities.

Materials, Particularly Pupils, Dealt With.

The main factor to be considered under this heading is the pupil. What we are concerned with is the extent to which the same type or grade of pupil is or may be interested in both fields, that is, the trade and industrial as distinct from the industrial arts. To answer this question satisfactorily, it will be necessary to consider some statistics, for we must know among other things with what the pupils' industrial-arts work is chiefly concerned. We must know, also, the extent to which, if at all, it concerns itself with part-time pupils. And finally, we must know what proportion of the total work of trade and industrial education has to do with full-time pupils. With these queries answered, we shall know much better whether the quarrel carried on by the members of the two groups has a real basis in fact.

The first outstanding fact is that the great bulk of industrial arts work is carried on in the sixth, seventh, and eighth grades, and that, therefore, it concerns itself largely with the pupils in these grades. Obviously, the degree to which it concerns itself with the eighth grade, for example, depends very much upon the upper limit of the compulsory attendance period. In Ohio,

the new law passed in 1921 requires full time attendance of both sexes until 16 years of age, or until the seventh grade is completed. It is manifest, in this instance, that the greater requirement was inserted in order to take care of laggards, since normal pupils who start school at six years of age have completed the eighth grade before they are sixteen. But so far as our problem is concerned, we must bear in mind that in the large majority of states compulsory attendance laws are less exacting than they are in Ohio.

The above fact is well indicated in the following government statistics which say, in effect, that of every hundred school children thirteen leave school in the fourth grade; another thirteen in the fifth grade; another fourteen in the sixth grade; and another 27 in the seventh and eighth grades. In other words, 67 per cent, or two out of every three children never get beyond the eighth grade, while almost fifty per cent never get beyond the sixth grade. The bearing of these figures upon our problem is easily evident. If two-thirds of our youth never attend school after the eighth grade, then it is clear that any type of education which deals exclusively with full time pupils will be of no service to those two-thirds of our population; likewise, is it clear that a type of education which is intended primarily for employed persons, will have chiefly to do with this two-thirds of the population.

Is it not apparent, when viewed from this angle, that, with the exception of a few localities, the two types of education under consideration are not only not intended for the same pupils but that in the very nature of things they cannot, for the most part, do other than serve two different groups? Is it not clear, also, that the only common ground possible to them is that of the full-time pupil who is definitely preparing to enter some vocational trade? That, relatively speaking, this number is exceedingly small need not be called to the mind of one who is at all conversant with current conditions. The truth is, the number of full-time pupils, taking the country over, who have definitely decided to prepare for a distinct occupation, rather than to continue in school for a longer or shorter period, is extremely small.

I am but voicing the conviction of others when I say that the so-called unit day trade school provided for in the Smith-Hughes Act is destined to play an increasingly smaller part in the entire trade and industrial education program. The reason, in full, for this I shall not take time to mention. Suffice it to say that the cost of providing the necessary equipment for carrying on such work is in most cases prohibitive, the outstanding exception being printing, and to a lesser degree, sheet metal work, and, possibly, auto mechanics. Broad, yet basic training, one might say, is not only what the schools should provide, but it is apparently the only thing they can afford, financially speaking, to provide.

I cannot refrain from mentioning one other reason why teaching trades to full-time pupils will not become an important phase of our educational system. The following figures tell their own story: Of 18,000 industrial jobs, which were carefully analyzed during the war, at least 76 per cent of them could be approximately mastered in periods ranging from one hour to one month, the average being ten days. These figures are supported by the following quotation from the December, 1921, number of the Atlantic Monthly, where Mr. Arthur Pound states that "seventy per cent of the employees for certain large allied plants could be fitted into their jobs in three days or less." Is it, therefore, necessary, or even excusable, to raise the question once more as to whether our schools can hope, except in a very minor way, to prepare our youth for industries which are becoming more, rather than less, specialized in nature?

Before leaving this phase of the subject it will be well to consider briefly the high school, the part it plays, and the way it bears upon our question. Practically all are familiar with the history of the development of the technical high school, whose promoters, as educational literature abundantly attests, profoundly believed that through this means they would be enabled to increase to an appreciable degree the number of first class mechanics in the industrial world; and how their bubble was pierced when they found that the boys who took technical work in high schools rarely ever were found at the machines; but, on the contrary, were almost invariably and within a short time after completing their school work enrolled among the minor executives of industry. An interesting side light upon this phase of the subject is found in some unpublished statistics gathered by Mr. H. W. Schmidt, of Wisconsin: he reports in a study of 15,000 students in 54 high schools that 6 3/10 per cent preferred agriculture as an occupation, while 31 per cent of the state population is engaged in agriculture; that 36 per cent prefer the professions, while 5 2/10 per cent of the state population are in the professions; that 4 3/10 prefer mechanical trades while over 34 per cent are in such trades; that 22 4/10 per cent—both sexes—prefer business and clerical positions, while 15 2/10 per cent are in such positions. The conclusions, which support my point of view as stated above, are that the occupations in agriculture and industry are recruited very largely from young people who have never reached the high school. Further support is found in a statement, which, unfortunately, is not supported by statistics published in connection therewith, found in the Manual Training Magazine, January, 1922. It reads as follows: "Eighty per cent of industrial workers do not go far enough in school to enter all-day trade schools."

When one carefully examines the question, he cannot but note that in all probability the real source of trouble is found in the socalled prevocational type of

education, for here, more than anywhere else, we find what seems to be the chief area of common ground. It is in this type of class, as is well known, that pupils are expected to gain helpful ideas regarding different ways of earning a livelihood; likewise, to acquire a small amount of trade knowledge and skill. If, in considering the bearing which this type of education has upon our topic, we remember that it is not recognized as falling within the scope of the federal vocational act and that it can be rather easily carried on in one form or another in industrial-arts work, we have gotten our fingers on the real cause of the controversy. Since industrial arts work cannot help from being of a vocational guidance character, how easy and natural it is to try to make it slightly more than that! Moreover, who would object to such modification of the course, of the method of teaching, etc., as is necessary, to make this service possible? But, while such is the case, it must not be forgotten that this is the sampling period—vocationally speaking—for the pupil, the period intended to acquaint him with different lines of activities, to broaden his conception of life, to enable him to think in new ways along new lines, to build up a keener appreciation of what is done with one's hands with the help of tools, machines, materials, etc. In short, the objective still remains unquestionably general, rather than specific, in character. One might say in all truth, that the prevocational service afforded is merely incidental.

Methods of Administration and Teaching.

Important aspects of the third phase of our topic, that of administration and teaching methods, have been foreshadowed in earlier paragraphs. There remains to give definite and detailed consideration to them. It is scarcely excusable to remind the reading public that vocational education, as such, presents problems of administration and teaching which were never dreamed of by the majority of present day school superintendents, a fact, which, by the way, is becoming increasingly obvious as the days pass, particularly in those states which have launched a real vocational education program. In view of this it may be maintained that the success or failure of the vocational education movement will depend to a very large degree upon the willingness manifested by superintendents and teachers to abandon or modify old ideas of ministering to the needs of pupils. What the most important administrative problems are has been indicated in another connection. (See "Outstanding Administrative Problems in Part-Time Education," by D. J. MacDonald, in Industrial Arts Magazine, September, 1921.) Let it suffice here to enumerate them and to indicate how they compare with or differ from corresponding administrative problems in the industrial arts field. Some of these problems are:

1. Getting hold of suitable subject-matter.
2. Finding and training satisfactory teachers.
3. Gaining and holding the good will of parents and employers.
4. Arranging satisfactory school programs, and others.

According to the testimony of persons who should know, one of the most perplexing problems faced by administrators and teachers in the part-time field, is that of securing and making proper use of suitable subject-matter. And when one recalls that the great majority of part-time pupils—as statistics amply prove—left full-time schools either because they did not like the work or because they were anxious to earn some money; also that these same pupils, as a rule, are being forced back into the very schools that a short time before they were glad to leave—when these things are borne in mind, I say—it does not seem strange that difficulties arise in providing subject-matter that will at one and the same time gain the good will of the pupils, increase, where possible, their vocational efficiency, and last, but not least, give them substantial assistance along civic and social lines. Putting the same thought in other words, the administrator of this type of school work faces an entirely different problem, at least in many ways, than the administrator of industrial arts. First of all, it is imperative, as experience proves, that in order to be of real assistance in a vocational way to his pupils, he must see to it that the various occupations represented in his school shall be thoroughly analyzed for the purpose of finding out in what way or ways the school may be of service, either directly or indirectly, to the young employees. He must have in mind, also, that pupils who are employed practically all of their time have entirely different ideas regarding the service a school should perform than have those who have always been in school. Administrators who are in a position to know maintain that the school work must be exceedingly practicable if the part-time pupil's interest is to be gained and held.

The fact that these pupils are mixing daily with men of affairs, and, as a consequence, are in touch more or less with those who manage our civic and social affairs, makes it imperative that no small amount of attention should be given to subject-matter of this nature. That is to say, the administrator must plan to capitalize the live experiences of his pupils and see to it that they profit to the greatest possible extent from an intimate study of current civic and social problems. Then he must take into consideration the fact that his pupils are still in the habit-forming stage and that, accordingly, he must minister to them in such a way that they shall learn to place value upon worth-while working habits, as, for example, accuracy, speed, neatness, loyalty, dependability, taking care of one's body, self-improvement, etc.

If we turn now to the industrial arts field, it requires but a moment to see that the administrator here, so far as subject-matter is concerned, faces an entirely different problem. In the first place, since he is dealing almost exclusively with full-time pupils, he does not need to concern himself, except in a very

few cases where the work is strictly prevocational in nature, with the question of increased vocational efficiency. Of course, he may know that a great many of his boys are intending to leave school at an early date, but, even so, the amount of time allotted to his work in the entire course of study is inadequate to make it advisable for him to attempt to do anything in the way of preparation for a vocation. At best, the service rendered will be nothing more than guiding in character. In fact, were he to attempt to prepare them for a vocation, he would be violating the primary objectives of industrial-arts work as indicated above. His problem, therefore, so far as subject-matter is concerned, is one of entirely different character. He, of course, has his difficulties in this field, but they are not difficulties similar to those of the administrator of part-time work, because, first, his objectives are different; because, second, he is dealing with an entirely different type of pupil; and because, third, his pupils are in school full time rather than part-time.

It is scarcely necessary, in face of the foregoing facts, to state that a different type of teacher is needed for the two kinds of work. In the first place, it is essential that the teacher of part-time pupils know considerable about the occupational world. He must, for example, know some of the trials and tribulations of his pupils as employees, as well as the qualities and characteristics in employees which count for success. Moreover, he must be more or less familiar with the specific demands in the various occupations represented by his pupils. Finally, he should appreciate fully the demands in the way of citizenship that should be conscientiously and willingly met by his pupils from day to day. I might add also that a teacher of this kind of work must be much more of a "mixer" than the teacher of full-time pupils; he must be better informed regarding activities outside the schoolroom; more alive to conditions in the social and economic world and not only keener but more competent to enter into a discussion of such questions, all of which qualities would be highly valuable but not necessary for an industrial-arts teacher.

As to the actual details of classroom procedure, especially in connection with the shop side of the work, there need not necessarily be extreme differences in the method of procedure.[1] In fact, it is my personal belief that approved methods of teaching manual work in our full-time schools might well be taken over bodily into the shop side of the part-time work. But, lest I be misunderstood, I wish to add that I do not have in mind when I make this statement, any slipshod or indefinite type of work; but rather, the type in which the objectives are clear and unmistakable. Suffice it to say that securing and holding the good will of the parents of pupils is a rather important item in the part-time teacher's schedule, while it occupies a rather insignificant place, or at least may do so, in the schedule of the teacher of full-time pupils. As to the problem of arranging satisfactory programs or schedules, this may be passed with the statement that in the very nature of the case, administrators and teachers in the two fields will have quite different problems to solve.

If the argument offered is sound, then the only possible place where any overlapping or duplication of service in the two fields appears is in connection with the socalled prevocational courses. Here, it is granted, that confusion, due to misunderstanding, might arise among administrators and teachers in the two related fields. But, I repeat, proper conception of the objectives of the two distinct types of education will effectively prevent such misunderstanding. For, as I have plainly indicated, where one deals with part-time pupils, the other deals exclusively with full-time ones; likewise, where one deals with employed pupils, the other at best deals only with prospective employees. If these distinctions are kept in mind, together with the respective objectives, there are good reasons for believing that administrators and teachers in the two fields will not only learn to antagonize each other less, but will be more and more willing to work together harmoniously in their efforts to solve different but closely related problems. It is the sincere hope of the writer that what he offers here may contribute in some slight degree toward bringing about this highly desirable state of affairs.

[1] It has already been intimated, if not stated in so many words, that shop work will never constitute more than a minor part of the trade and industrial public school program.

EAST HIGH SCHOOL, ERIE, PA., TRADE TAILORING CLASS.
H. E. FRITTS, INSTRUCTOR.

FIG. 11.—GATE LEG TABLE.
Courtesy of Mr. H. J. van Hemert, San Juan, P. R.

Reproducing Antique Furniture in the School

Herman Hjorth, Director of Technical Work, San Juan, Porto Rico

Tables (Continued)

THE Gate-Leg or Gate-Table, as it was first called, dates back to the days of Cromwell and has retained its popularity through all the succeeding periods to the present time. In the latter part of the Cromwellian period (1649-1660), and even more so after the Restoration, it became the fashion to have small coffee and tea parties, card games, etc., and these social amenities created a demand for small tables. Hence the development of the Gate Leg table and many other small tables of various shapes, among them the card table (See article in January, 1922, issue). Drawers in tables also date back to this period.

During the Queen Anne period (1702-1750) Gate-Leg tables also began to be used as dining tables and this was evidently the purpose of the large table illustrated in Fig. II. This table is made of oak, and the

FIG. 12.—GATE LEG TABLE OPEN.

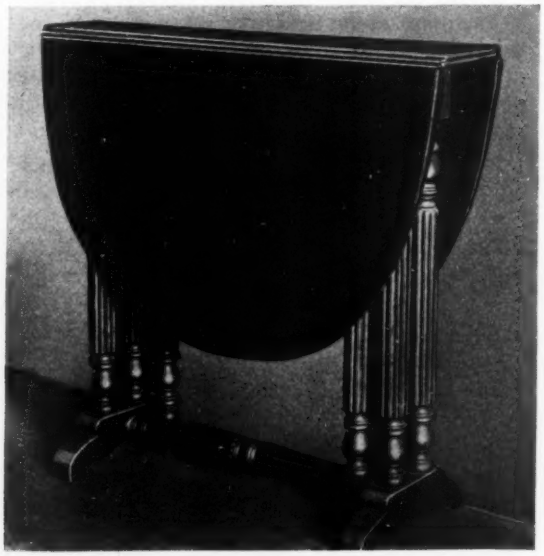


FIG 12a.—GATE LEG TABLE CLOSED.
Courtesy of Mrs. E. W. Keith, San Juan, Porto Rico.

shaped apron at the ends, as well as the carving and turning, indicate that it belongs to the Queen Anne period. On account of the size of the table, it is provided with two gates on each side instead of one, which is more common. As may be seen on the drawing and photograph the gates swing on pieces of ¾" stock mortised into the apron and turned rails, slots having been cut in the rails of the gate to fit over them. They

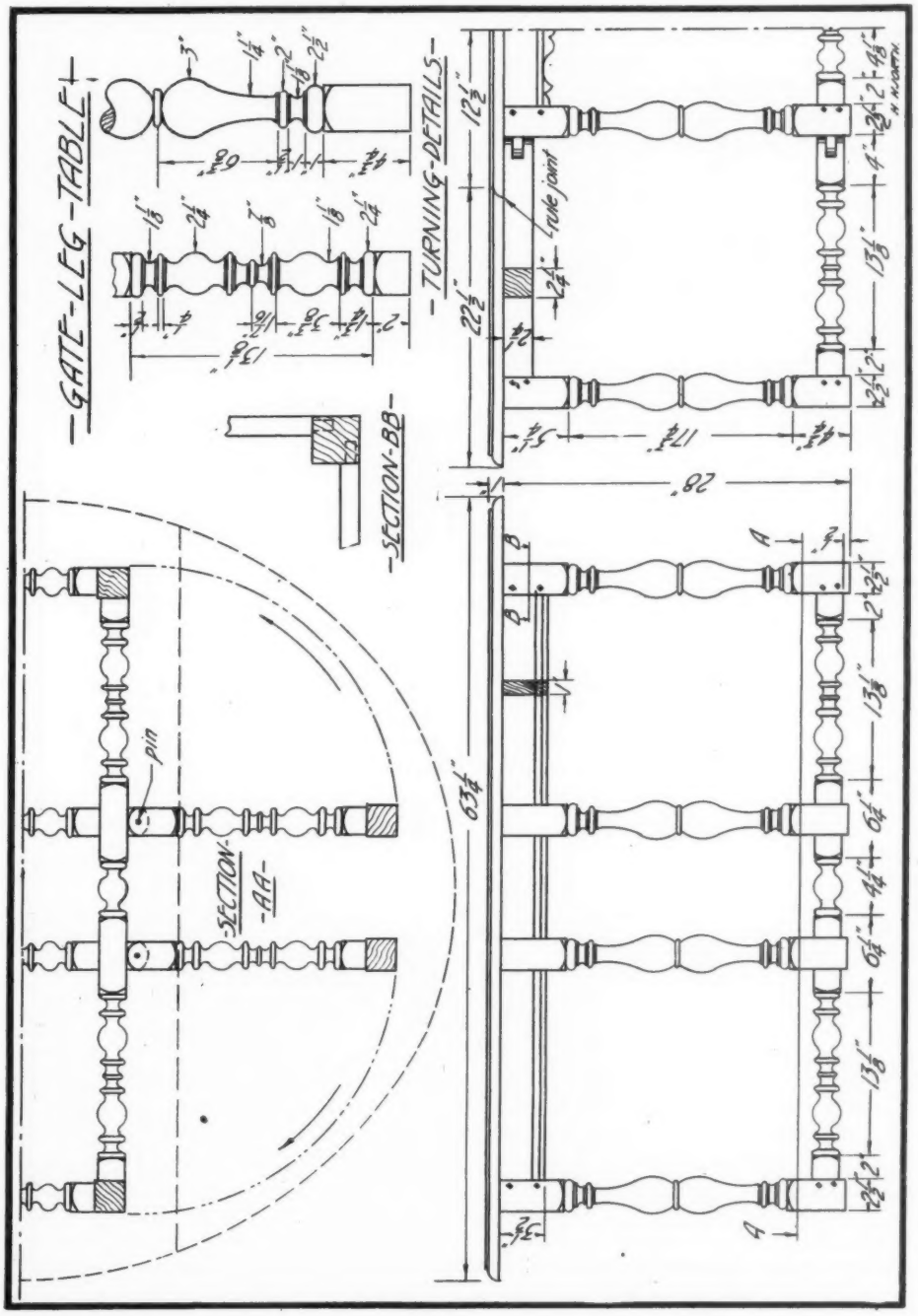


FIG. 11a.

are pinned together in the center and much resembles a slip joint with rounded ends. Care must be taken to lay out the holes for the pins, so that when the gate is closed its legs will come flush with the fixed legs. All mortise and tenon joints are pinned together with two wooden pins each. The normal position of the gates is at an angle of about 45 deg. with the long rails as shown in the photo, and stops are generally glued to the underside of the leaves at these points. The gates were shown at 90 deg. in the drawing on account of ease and clearness of representation. The two movable leaves of the top are hinged to the fixed

part of it by means of a rule joint. The legs may be carved, fluted or left plain.

The table, Fig. 12 is a very graceful small Gate-Leg table of the Sheraton period. The four fixed legs are square at the upper end and glued at opposite sides to the 1-⅛″ piece supporting the narrow fixed top, as shown in the drawing, after which the ends are covered with a piece of ⅛″ veneer, making them appear solid. The gates open by means of a simple finger joint, explained on p. 69 of the February number of the magazine. A groove is cut in the edge of the top all around, the leaves are hinged with a rule joint, and the legs and stretcher at the bottom are readed.

(To be concluded.)

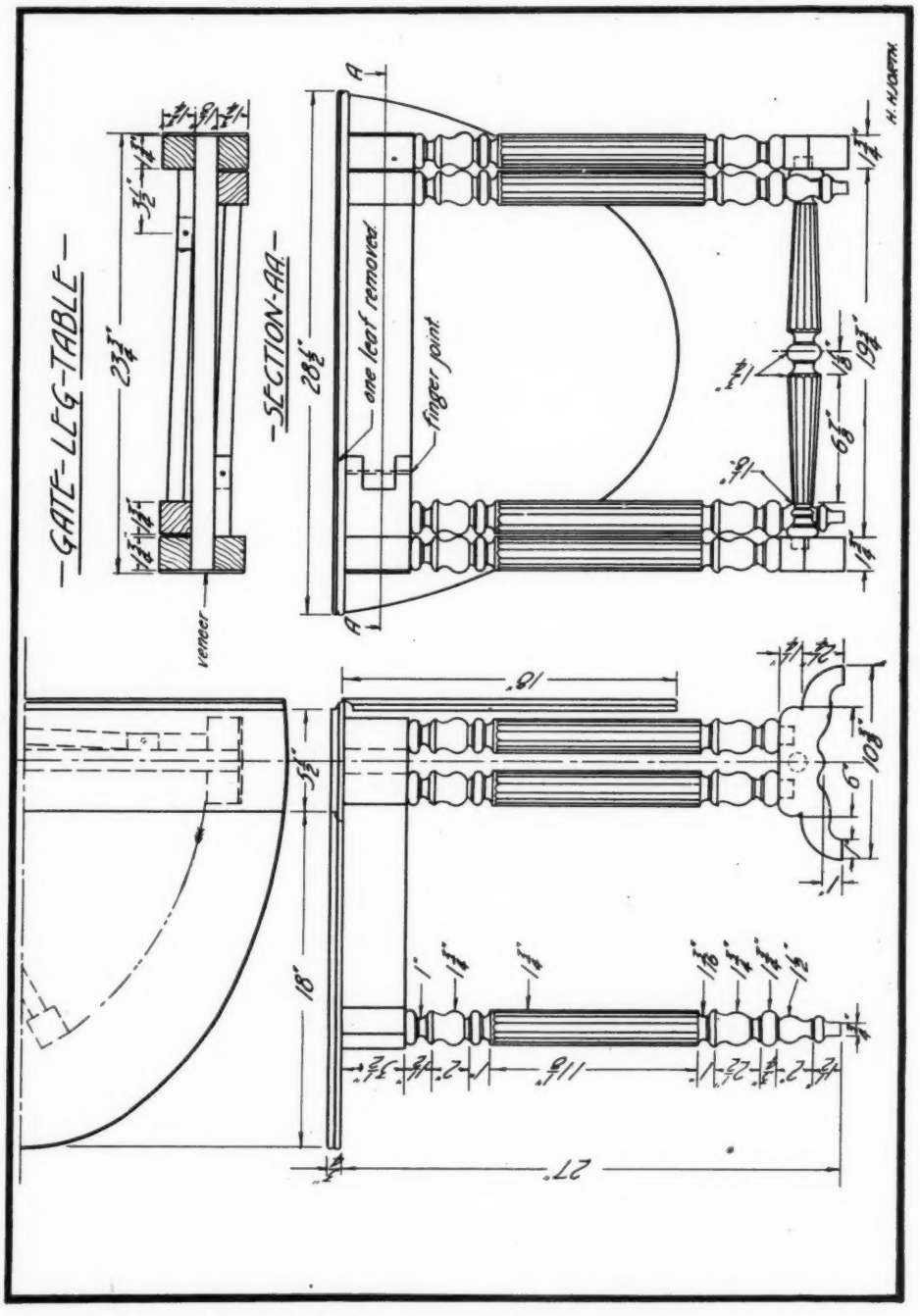


FIG. 12a.

There is a task for every man in the world and an opportunity to justify the existence of every one except the quitter. And the biggest quitter of the Lot is the man who can but will not work.—System.

The Mechanic-Teacher

Arthur B. Mays, Professor of Industrial Education, University of Illinois

IN all types of vocational education from the earliest times, it has been the universal practice to look to the vocations to furnish the teachers of those vocations. The law has ever been taught by men who have been practicing lawyers; medical colleges employ doctors to teach medicine; preachers are employed to teach theology; and architects, to teach architecture. It is therefore, not a strange idea that mechanics should be employed to teach trades, now that society has come to believe that vocational education for those who work with their hands is also one of its obligations. Neither is it a new situation to find trade trained men in our teaching corps, for in many places manual training teachers have been drawn from the trades. But since the advent of federally-aided vocational schools such large numbers of trade-trained teachers have come into our schools that some very important problems in regard to their status and adjustment to school conditions have arisen.

When we state that the presence of trade-trained men to teach trades is simply the extension of a well-established principle in educational practice, we are not saying that the case of the doctor teaching medicine and the case of the carpenter teaching carpentry are alike in all respects. In fact, the two cases are vastly different. In the former situation, a well-educated man, who is one of a select intellectual group, is teaching adults. These latter have passed through various stages of educational experience, which are highly selective, and they, therefore, are themselves a select group. In this case the teaching doctor can be reasonably successful in imparting the necessary scientific knowledge to his students, even though he is utterly without any scientific knowledge of the teaching processes and is most unskillful in his methods. In the latter situation, we often have a man of limited school experience who has a narrow trade training obtained usually by haphazard means, teaching immature boys who have a limited education and who present all of the most vexing problems of educational method. It is clear, therefore, that for the mechanic-teacher to know thoroughly his trade is for him only "the beginning of knowledge" needed for success in the school.

Problems of Adjustment.

The seriousness of the problems presented by the presence of the mechanic-teacher varies according to the type of school in which he is placed. In the full-time trade school and the trade extension school, he offers a less serious problem than in the general continuation school or the technical high school. But in all of these places he is in many instances giving the supervisors and heads of department of industrial education much concern. And it should be stated emphatically that he gives concern not because of any inherent undesirableness or lack of ability but merely because of his lack of training for his new job and lack of school experience. It is a matter of training and adjustment. When proper training has been acquired by these men and the needed adjustments to school conditions have been made, they are without doubt the best shop teachers to be had from any source whatever.

Another very important phase of the adjustment of the mechanic-teacher to the school organization is the attitude assumed by the other teachers toward him. Too often he is regarded as a necessary evil to be tolerated but not to be considered as a legitimate member of the faculty nor as one whose opinion is seriously to be regarded on matters pertaining to the policies and conduct of the school. This attitude reacts most unhappily not only on the shop teacher personally but on his courses and often on the students in his classes. Without attempting to offer any defense whatever for this narrow, ungenerous attitude, it may be said that the remedy for such a situation lies very largely in the hands of the mechanic-teacher himself. By properly equipping himself for the work of teaching and by a change of attitude toward his new work, he can in time overcome most of this unfortunate antagonism and distrust.

The important element in the assimilation of the mechanic-teacher by the school organization is, therefore, the proper professional training of such teacher and the bringing about of a different attitude toward his work. As a "practical" man who has spent his life, before coming to the school, in the rough and tumble of industry and who has by virtue of his contacts and shop experiences come to distrust theories and to undervalue idealism and remote ends in education, he is very likely to feel that his new associates are unpractical. As paradoxical as this is, it is not without value but is a most serious handicap. The manner in which he learned his trade is also likely to be a source of much difficulty in the carrying out of an orderly, logical teaching process in the school shop.

A very common question asked by the new mechanic-teacher is, "What shall I teach first?" And a curious phenomenon is often observed when he is left wholly to his own devices, namely, that he devises a sort of course of work that is abstract and wholly unpractical. As paradoxial as this it, it is not without value to the supervisor, when it occurs, as it indicates a recognition of the idea that shop work must be presented for teaching purposes in a manner different from that involved in picking up a trade. Doubtless the chief difficulty at this point is the fact that the shop teacher was not conscious of learning steps in the acquisition of his own trade knowledge and, therefore, is unable to

reproduce an orderly arrangement of material for teaching purposes.

Another very serious difficulty in his way is in many cases a consciousness of an inferior general education and a resultant oversensitiveness to the attitudes and expressions of his fellow teachers. This often results in either an unwonted timidity or an unfortunate type of bravado, either of which makes more difficult the solution of the problem of his adjustment to school conditions.

Training and Supervision Essential.

What, then, should be the character of his training, and how can he be adjusted to the school situation? He can be left, of course, to work out his own salvation. Occasionally a man is found who can find his way unaided to a place of respect and great usefulness in the organization, but such a man is the very rare exception. Another way to bring about the change needed is to give him constant and painstaking supervision in his work, and in a few cases this is successful. But careful supervision without the needed attitude on the part of the one supervised and without a fairly broad general and professional background is not likely to produce more than a mechanical compliance with detailed instructions. The solution of the problem, therefore, seems to lie in a carefully conducted professional training course supplemented by sympathetic, intelligent supervision of teaching work until the desired adjustment has been accomplished. And experience seems to show that training while in service is by far the most effective form of professional training for the mehanic-teacher.

The first step in his training and the most important of all is that of leading him to realize what it means to be a teacher. It is an almost useless waste of time to teach mechanical methods of analysis of material, lesson planning, class organization, systems of shop record, etc., until he has come to think of himself as a teacher and to recognize his new problems as *teaching* problems. This is indeed the most difficult part of the training of a mechanic-teacher. It takes time and patience, but it is time well spent. This step in his training should not be left until it is completely accomplished, no matter how urgent the element of time. Nor can this matter of attitude be accomplished by merely reiterating "you are now a teacher." It comes very largely through a consciousness of the possession of professional knowledge. One responsible for the training of mechanic-teachers is therefore failing in his most important task when he permits himself to rush through the fundamental considerations of the learning processes of the mind and the well-established methods of creating proper relations between learner and teacher.

When the teacher attitude is attained and a genuine interest is developed in the professional problems common to *all* teachers, then, and not till then, should the technical and more or less mechanical processes of analysis and organization of teaching material be taught. It is not the purpose of this discussion to belittle "job analysis," lesson planning, and such things, in any way whatever, but to insist that they be used only as a means to assist a *teacher* to do his teaching more effectively. They in themselves will not make of a mechanic a good teacher of shop work.

Arousing Professional Interests.

Experience has further shown that the extent to which the mechanic-teacher becomes interested in professional literature, and technical books will have a very definite bearing on the type of teacher he becomes. And the development of such interests should be a very definite part of the teacher training program. It is astonishing how rapidly a mechanic-teacher will develop in his new work, when once such interests are aroused. Nor is the greatest development to be had alone from the finding of interests in the problems relating to the field of education. It is often surprising the range taken by the interests of men from industry when they once begin to study seriously the problems of education. Such problems are so closely related to the social sciences and to other fields of knowledge that interests in these fields are naturally and easily formed. It is not meant here that a training course for mechanic-teachers need include such subjects but it is urged that every possible encouragement should be given during a teacher training course to the development of interests in a wide range of subjects. It is not unusual to see the quality of work of a trade-trained shop teacher wonderfully improved by the development of an "outside" interest which takes him far afield into the world of books and investigation. The training of a mechanic-teacher must not be a narrow "trade training" if it is to be an effective teacher training.

When he finds his place in the school, the mechanic-teacher can bring much of value to the whole organization. He is likely to inject a new spirit into the situation because of his experience in the world of material production and because of his sense of values when applied to the work of instruction. His whole attitude is colored by the idea of utility. The schools generally need this influence, and schools training boys and girls for industry must have it. The force of this influence is felt both as regards method and subject matter. His very expertness as a mechanic will also bring a new spirit into the school work, and cause it to make a much stronger appeal to the motor-minded student. Such a spirit in time reacts on the work in all the subjects taught and causes a most desirable change in the attitude of the teachers of academic subjects toward their work. The broader his training and the greater his interest in the general problems of the school, the more will this influence be felt. Not only is a most valuable new spirit brought into the school by the trade-trained man, but in no other way can the

schools be closely tied up with industry and the life for which it is preparing its pupils. This much desired condition of making the work of the vocational school "real," and "practical," and "related to life" must come through the presence among the teachers of men who have lived and worked in the industrial world. The full value of this contribution of the mechanic-teacher can be realized only when all the teachers of a school work harmoniously and entertain a mutual respect in the daily work of teaching and administration.

The unfortunate attitude of the teacher of academic subjects toward the mechanic-teacher will rapidly disappear when he discovers that the shop teacher from the trades is not only a very skillful, high grade mechanic, but is as well a teacher who appreciates the value of his own work in education. And the mechanic-teacher will soon discover that his trade skill and knowledge of industry which he brought from outside the school will command respect from his associates, when it is accompanied by professional knowledge and an understanding of the larger problems of education. Such a result can come only when the training of both teachers is sufficiently broad to include a common professional and general knowledge in addition to expert knowledge of the special subjects each teaches.

Methods Which Make Domestic Art Interesting and Practical

Miss M. L. Wisner, Rockford, Illinois

BECAUSE of the everchanging subject of domestic art, which is being modified as much as the curriculum itself, ideas when applied, will help to make the course more interesting and practical, are suggested here.

Every growing subject faces new problems. One of the problems now confronting the teacher is the commercialization of domestic art. This is not to be discouraged as long as it leads in the right direction. High school girls crave faddish garments which they see in stores and try to carry across these ideas into their garments. The teacher should not discourage this entirely for girls of this age like novel ways of trimming, but she should emphasize more appropriate trimmings and garments. There is no reason why a girl should not copy style, but the problem the teacher has is to instill good taste in spite of the fads.

There is also a tendency towards brevity of dress. That is for girls to wear as few garments as possible; all loose, straight, simple with little or no trimming. The sewing teacher must handle the problem delicately with high school girls, encouraging clothing which does not tend to sloppiness, hurried construction and vanity. This problem is perhaps more acute in large schools than small ones.

For these reasons there are several lessons given over to the study of proper clothing for all occasions. Such little problems as wearing satin slippers with middies or pearl beads with sport blouses are discussed. To make this more interesting clippings from catalogs, advertisements or fashion magazines are used as illustrations or if magazines are plentiful girls may clip coats, shoes, etc., suitable for certain occasions, each girl being assigned a definite outfit. If the girls come from homes where magazines are not available the teacher may select practical magazines and, with the girls gathered around a table, discuss with them attractive features of garments before they plan their clothes. Every attractive garment has a center of interest, the appreciation of which the girl does not feel until it has been pointed out to her. Development of appreciation for appropriate dress may be brought out in this manner. After this is done the girls may visit stores and sketch from memory if possible the center of interest of desirable garments. This trains for close observation and at the same time aids in the creation of designs for their own garments. In advanced sewing the girls should attempt to modify plain commercial patterns to the style desired. After the style has been selected the next problem is to determine the amount of material necessary. Frequently girls have vague ideas about the amount of material necessary and often leave it to the clerk. The teacher should explain the method of laying patterns on the goods and show the diagrams on the backs of commercial patterns. Then clippings of garments may be handed out and the girls asked to calculate the amount of all goods and trimming necessary for them. This is where arithmetic correlates with domestic art.

In guiding the pupils' choice in selection perhaps one of the best methods is to have placards posted with samples of goods and prices if possible. This is especially true in the selection of laces and embroidery. The poor as well as the good should be shown, but should not be emphasized as much.

It is advisable to have samples of goods and clippings of garments which constitute the new projects posted on the bulletin board, which, by the way, is a very necessary article in a sewing room. Along with the bulletin board it is convenient to have a magazine rack and a demonstration frame which any manual training department can make. It is merely two picture frames about 11″ x 14″ hinged at the top, and cloth is slipped between and held tight by pegs. It many be hinged to a piece of furniture or fastened on

a frame. Such a frame is especially good for demonstrating stitches, button holes, etc., yarn being used instead of thread.

At the beginning of the garment construction, poor and excellent garments may be brought from stores on approval for comparison in construction, and materials as well as cost. This is also for another purpose and that is to aid the girl in choosing ready-made garments in case she should buy. Most merchants are willing to lend the desired garments for they say they sell either way—materials or garments.

During the process of construction the taking of long notes is a waste of time. Since chemistry and other subjects have manuals for laboratory work is it not advisable to have such in sewing? The manuals are printed in the print shop and bound by the students in the art class, for in our school the art correlates very closely with the sewing. Sketches or plans of the garments may be kept on blank sheets of the book so that the teacher can glance at it and understand the child's problem. The sketch corresponds in use to an architect's blue print. Besides notes which do not always make the idea clear to the pupil, samples or models in different stages of construction may be on hand for the pupils to examine. Different finishes for certain parts of a garment may be placed on one placard. I have found this to be extremely helpful in dressmaking classes where girls were not quite sure just what finish they wanted to use.

It is hard to keep the class together on a problem. A plan which I have used with success is to make a brief outline on the board of each lesson. Number and date the lessons showing the number of lessons for construction and the date for completion of the garment. If a pupil is extremely slow and cannot keep up, encourage simpler problems and give her extra help, so the class can work in unison.

Since various finishes may be used by different pupils on the same problem, the girls may get a broader idea of construction if they are allowed to examine each others' garments. After the garments are finished, a score card and a garment are handed to each girl. Of course the girls' score is not taken as a final grade, but it helps them to judge garments and to observe construction. The score card may vary but the one we use for dresses is as follows:

Neatness of finish	15
Ready made effect	25
Correct construction	25
Harmony of colors in materials	10
Similarity of design and materials	15
Practicality of garment	10
	100%

These ideas have been tried out in our High School and have been found satisfactory and successful in making domestic art a live study, demanding thinking and planning, as well as originality.

Conventionalizing the Oak

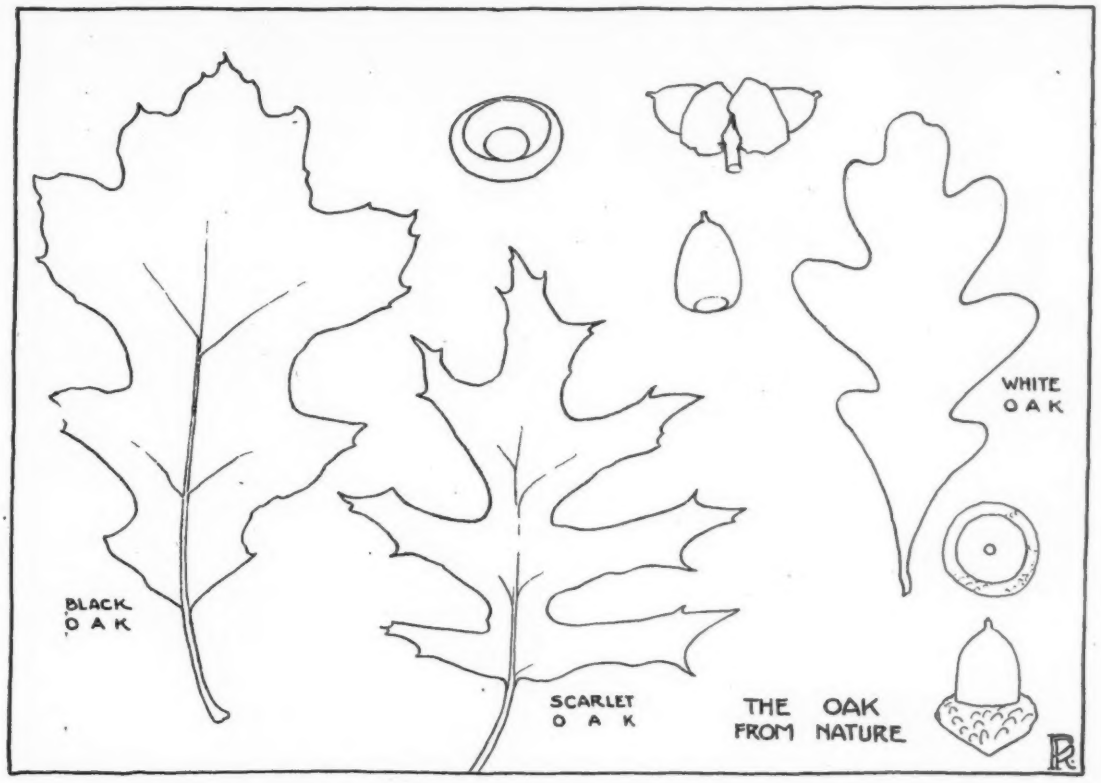
Charles H. Richert and Otis Philbrick, Rindge Technical School, Cambridge, Mass.

THE designer lives in a land of plenty. He is surrounded by a bounteous supply of material for use in his work. All nature seems to be chiefly and cheerfully concerned with furnishing him with the source of an endless number of designs. All places—the woods, the fields, the seashore; all things—animal, vegetable and mineral, contribute towards an ever-changing menu of tempting things for his consumption.

Most of this material when gathered is in a raw unpalatable state. It needs to be thoroughly mixed with gray matter and baked in the artistic fire of the mind.

The first sheet shows the oak leaf and acorn as gathered first hand from nature. Of the three varieties shown the leaf of the white oak lends itself most easily to use—having fewer points than the others. The acorn, singly or in groups of two or three, forms a welcome contrast in size and shape to the leaf. These forms as shown are not designs but design elements. They are fairly accurate drawings of the oak and acorn as found in nature and are drawn on this sheet as the most convenient way of recording the facts.

The forms on the sheet entitled "The Oak Conventionalized" show these same elements after being modified for use in decorating some space or object. Some forms need nothing more than elimination to be suitable. Others serve as a basis for further elaboration along a conventional line. Nature exhibits her products in an apparent confusion to the eyes. It is the designer's task to bring order out of this confusion. Sometimes changing all curved lines to straight ones accomplishes this as has been done with both leaf and acorn on the sheet shown. Any teacher of design who has explained the process of conventionalizing year after year to a class will find several ways of bringing it home to them—probably by comparison. Comparing the raw material as gathered directly from nature with the rough lumber as cut in the forest and showing the necessity for changing the blossoms and leaf forms just as the lumber is sawed and planed and carved and stained before being fit for use indoors helps to make it clear. It is a strange language at first to most students. Before you teach them how to do it you must teach them why it should be done. That which seems so clear and reasonable to the teacher seems vague and incomprehensible to the beginner. The original elab-



orate shapes as found in nature often seem more important to them than any others of their own invention and they are quick to gauge their ability falsely by the accuracy with which they can copy these natural forms rather than by the originality they show in inventing new shapes. Copying requires merely an imitative instinct—modifying means using the intellect in a creative way.

Many beautiful designs are abstract and have no origin in nature. Their attraction depends upon pattern. Pattern is the interesting variety of shapes into which the area has been broken although variety is often overdone and results in a "busy" design. The thing to strive for is a balance—a nice and interesting relation between the size and shapes of the different parts.

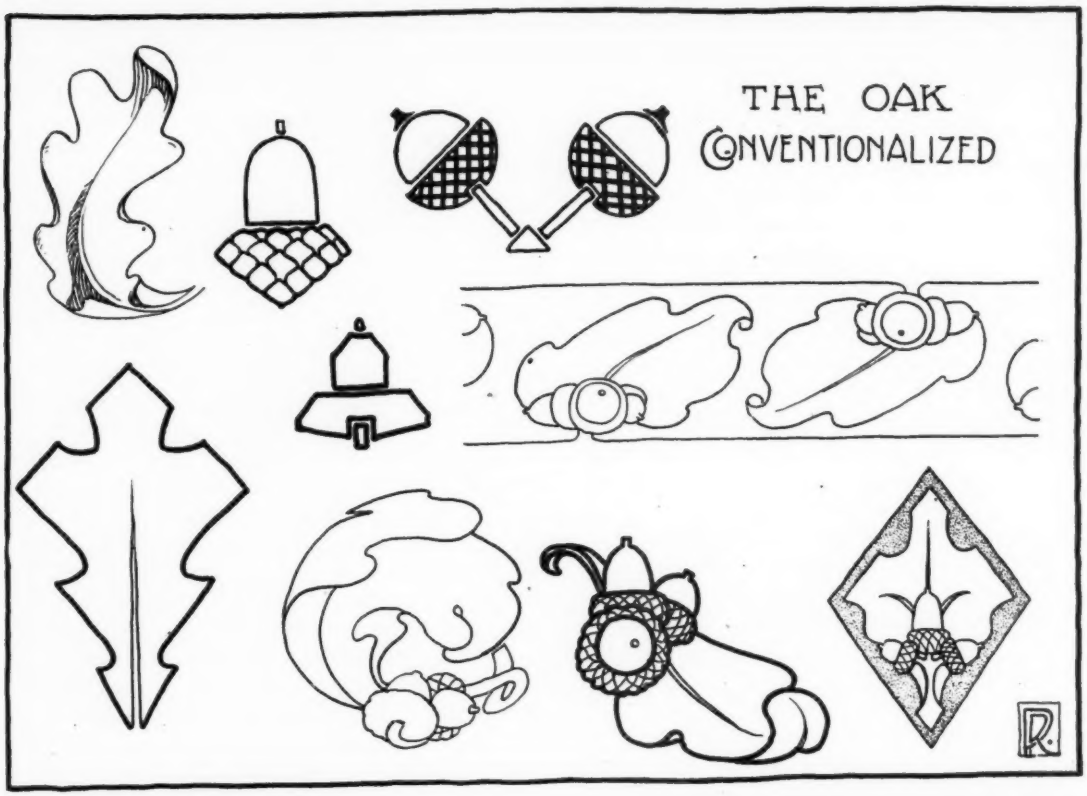
This is the story that a design should tell. A design should not be confused with a picture, although it should be seriously considered in the making of a picture. A picture might be vague or mysterious in parts while a design should be clear, concise and definite with no doubt as to where every line goes and what it does. A design is often an agreeable pattern applied to the surface of some object of practical use in such a manner as not to destroy or interfere with the usefulness of that object but to make it have a refining and stimulating effect upon our everyday lives. This effect is tremendously important and cannot be too zealously fostered. Men are compelled by the natural instincts and cravings to supply themselves with food and shelter. Most of us need no urging to try to do this, but our craving for refined things may be stimulated or retarded by the influence of our surroundings and the efforts, good or bad, of those who make them.

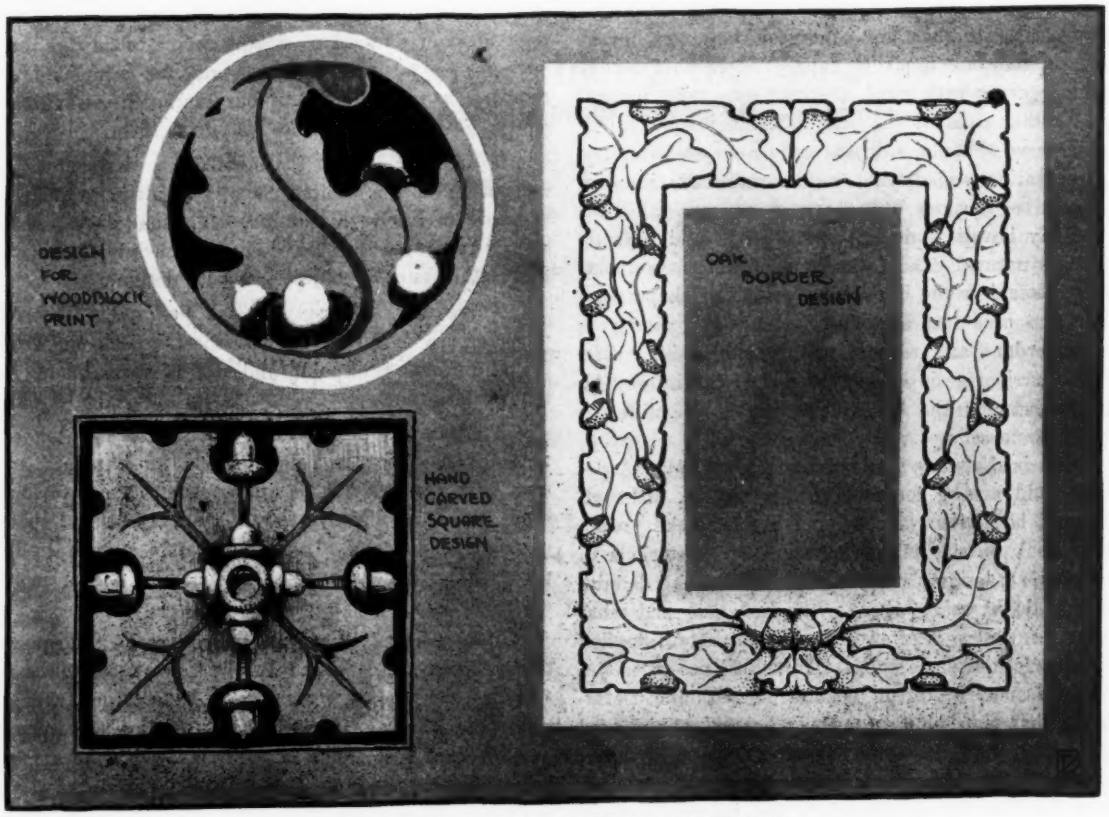
There should be in the mind of the designer some realization of the limitations of the ultimate surface which is to receive his design. It cannot be too constantly reiterated that any design which interferes with the usefulness of an object is a poor design.

Three ways of applying oak designs to definite purposes are shown on the last sheet. Each one calls for a different viewpoint and different treatment in the working out.

The circular design for a wood block is intended to be worked out in color. Wood block prints are used very effectively in decorating draperies of various kinds and is an effective way of lending cheerful spots of color to a room. It is also simple enough to be used with a little change as a stencil in one or more colors for the same purpose.

Many uses might suggest themselves for the square design for wood carving. It would work out successfully as the top of a small box, or enlarged, would make a panel in a carved chest. Notice the square sturdiness of this design as contrasted with the appropriate flowing lines as found in the circular design. A design should be influenced by its environment,





APPLICATIONS OF CONVENTIONAL OAK DESIGNS.

which in this case is the shape of the figure containing it.

The border was originally designed for a book plate, the lettering for which has been omitted in the reproduction. It would also make a very appropriate border for a lumber advertisement. It illustrates very clearly the compactness which a good border should have. A border is, in a way, a sort of fence and a good fence should be fairly tight and not have any very great openings in it. In this case the arrangement of the leaves and acorns have been conventionalized perhaps more than the individual shapes so that they present an orderly, well-regulated mass rather than the apparently haphazard array as found on the trees.

From Millroom to Paint Shop

Ralph G. Waring

IF a necessity, all preparation for the finish of any school shop product must begin where the millroom and cabinet shop assembly cease. It is to be suggested, however, that several bad practices common to both, make the work unnecessarily hard. Failure to join heartwood to heartwood or sapwood to sapwood means extra work in the finishing room in trying to match up stain work. Failure to run all grains in the same direction, in a top for instance, will develop dark and light streaks which no amount of work will entirely eradicate. The worst omission, however, is the failure to wash off all glue squeezed out of the joints during assembly. It has been my practice for some years past to use a scrubbing brush and hot water to thoroughly remove all excess glue (Fig. 1) while still soft. This operation prepares the wood for the final sanding and entirely does away with the extremely tedious and unnecessary after-scraping and sanding of dried glue, which generally becomes as hard as glass. After the clamps are removed, the entire piece should be sponged over with hot water to raise up any bruised portions and open the pores ready for the finishing work.

When thoroughly dry, the piece should be carefully sanded with 00 paper using blocks as illustrated. The heavy hard blocks I had made from the heaviest wood available, 1 ¼″ x 3½″ x 5″, and faced with soft cork linoleum ¼″ thick, the burlap backing of which was glued against the block face. This soft linoleum is always available as remnants in the stores, and prevents the sanded face of the cabinet work from being marred. The soft blocks are "hard" Spanish felt, 1″ x 3½″ x 5″, which is purchased by the pound. The use of these two types save many hours of sanding, besides producing the best sanded face possible. I have found that a back saw held, as illustrated, against the paper face of the sandpaper enables it to be torn quickly, a half dozen sheets at a time and overcomes the waste occasioned by the usual folding and tearing method. (Fig. 2). For cabinet sanding the paper should be torn into quarter size sheets which affords a ½″ hold on

Fig. 1.—All glue should be washed off while still soft. Note handy arrangement of clamp racks and wash basins. It is conducive to neatness, fast work, ready inspection and keeps all glue work segregated. Special note should be taken of the "glue ladder," of varying lengths and notched at 6 inch intervals to permit bar clamps to be held upright during "clamping up."

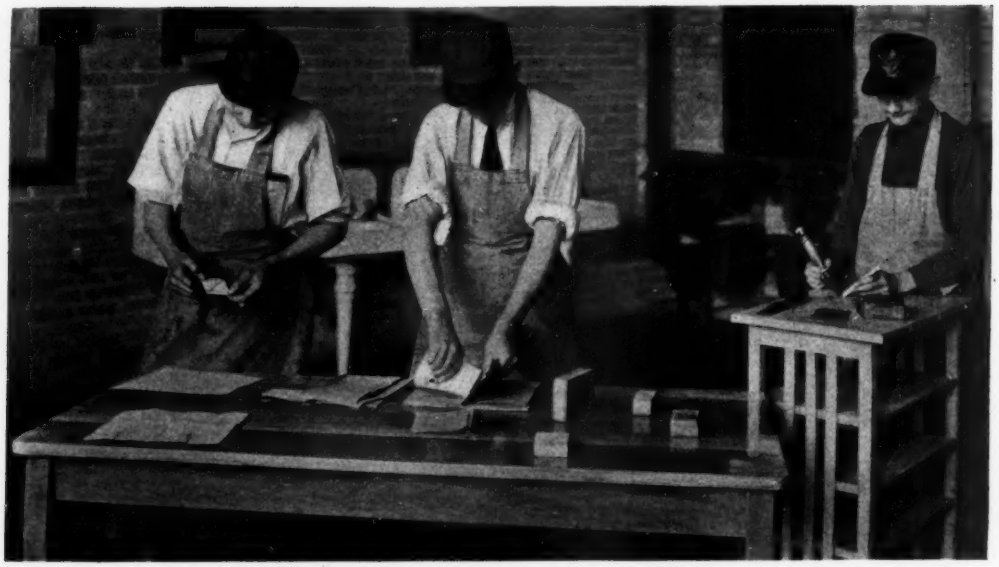


Fig. 2.—Boy at left has folded a 6"0", double surfaced finishing paper in eight parts and laid on table in front. He has started to split a hand sized, eighth section. Boy in center illustrates a handy method of tearing sandpaper, with the hacksaw, into half and quarter sheets. The large block on edge is 1¼" x 3½" x 5" faced with ¼" cork linoleum. Small block directly in front is a "half block of 1" Spanish felt, (hard). The other two blocks are ¼ and ½ size. The boy at right is "burning in" light colored shellac to match the finished work. It will be leveled off with chisel and scraper and sanded down clean. Holding the copper as shown, enables the operator to see the shellac drip off freely.

each side of a sand block 3½" x 5". The top edges and corners should be rounded off at least ¼" to prevent blistering the hand. "Edge" and "half size" blocks can be prepared by cutting a block in half lengthwise and crosswise.

In sanding cabinet work for the finishing room be sure that all face edges are rounded at least 1/16" in order that they may not wear white in use, or be rubbed white during the finishing process. Failure to look after this point is responsible for a great deal of unsightly work, especially in the darker finishes. A square, sharp edge, is an unnecessary nuisance in the paint shop and should never be tolerated. Very close inspection should be given to see that all sanding is done "with the grain." Cross sanding produces scratches which absorb many times the usual amount of stain and hence naturally spoil a good finish. This is one of the commonest evils of most finishing rooms, especially in trade schools.

Assuming that the piece is properly sanded, it should be carefully dusted off with a painters' duster and taken into the paint shop. This shop of necessity must be what local conditions dictate, but experience again, may suggest practical ideas of value. Where both classroom projects and general jobs are done, a room 20′ x 30′ seems to offer the best possibilities (Fig. 3). The light, if possible, should come from windows on one end only, in order to avoid cross lights which are a great nuisance in a paint shop. It should be adequately lighted with frosted 200 Watt lamps, with reflectors of medium concentration. Bare filament lamps of high power are to be avoided, as they should be dropped to about seven feet from the floor, where the powerful intensity of the filament would constantly attract and injure the eye. Where natural lighting is poor to fair, in order to teach color matching and shading, it is best to use "Colonial Mazda" blue filter lights which supply a quantity of light having a constant spectrum, making color matching on bright or dull days fairly easy. The following floor plan is the result of much study and use (Fig. 4.) All equipment wherever possible should be movable or assembled on horses or brackets in order that the shop may be easily cleaned and, when large pieces are being taken care of, moved out or folded away. Reference to Fig. 3 will show a satisfactory method of handling bulk oils, reducers, etc., where little or no chance may occur of using the wrong material. The doors of the cabinet as illustrated are of the sliding type and for this reason are to be greatly condemned as an insufferable nuisance. By all means have them hung on butts. Crushed fingers, doors falling out, or sticking, due to shrinking and swelling are only a few of the evils of this type of door. The horizontal arrangement of upper shelves and vertical stalls of the lower section work out very nicely. Dry colors may be stored in drawers as shown at the extreme left of the cabinet. Colors in oil may be stored as shown.

Assuming that a piece has been put in the paint shop, all screw and nail holes should be filled and any knot holes, checks, etc., also filled. Whether this will be done "in the white" or after staining will depend on the type of filling to be used. When putty or wax "stopping" is used, it should be done after staining and shellacing, in order to match the color exactly. If however, "burning in" is employed, color shellacs

tinted to match the finished job should be used and run into the hole with an electric soldering copper, as shown in the cut (Fig. 2). The copper should be hot enough to make the shellac flow freely but not enough to cause bubbling. It will be necessary to clean the copper frequently of burnt shellac. The latter should overfill the hole slightly and then be brought to a level with a very sharp chisel and sanded clean. Avoid leaving any "ring" of shellac around the hole. Absolutely nothing but the well-filled spot should show.

The work should now be stained. To the inexperienced it is more or less of a bugbear to start a large piece for fear they will "go in the same hole he came out of." The veriest tyro, however, can easily begin and finish his work of staining, shellacing, filling, varnishing, painting, etc., if he will but remember this rule:

"START WITH THE PART YOU SEE THE LEAST. END WITH THE PART YOU SEE THE MOST."

If this is carefully observed there will be no occasion for becoming stained or spotted with finishing material. In the case of large tables I find it best to finish frames and top separately since they are more easily handled, finished and inspected. Before the last coat of finish is rubbed out on the tops, they may be laid on padded saw horses and the cleated rails screwed to the tops. The tops may then be finished and the job is complete.

Fig. 3.—Staining and Varnishing in the Paint Shop. This illustrates a handy and economical arrangement of cupboards, oils, color stocks, etc. Dry colors in drawers are shown at extreme left. Plain, block letter labels on cans give reasonable assurance of safety, as to contents. Drying rack at left is handy for class test panels and jobs like kindergarten trays made in quantity. The long table at left is 40 inches wide, but experience shows it more desirable to have it 24 inches and hung on swing brackets, rather than on horses. Note height of lamps above floor; shades are too concentrated and should be changed to next widest or ¾ concentration. Where tops and frames of table are finished separately as shown, easier and better work results. Book ends of walnut or butternut, inlaid with curly maple furnished a fine practice piece in teaching staining, shellacing, filling, varnishing and rubbing to beginners. Note the stain work of boy at left. Strokes should be laid on from raw wood to stained work in order to blend in. Reversing this will show heavy laps and streaks. Boy at right is varnishing tops. Table frames were varnished day previous.

In all classwork I find that best results are obtained by using water stains. They are cheapest per gallon, can be matched up readily, and can be thinned or reduced without stocking any special material. It is almost impossible to produce good clear finishes with the spirit or oil stains now sold on the market. I have tested a great number of brands, none of which was worth the testing when compared with the results of water staining. I have had men of forty years' experience working for me on contract work who could not get respectable results with several nationally advertised brands. If journeymen of a life time of experience cannot get results how then may shop instructors expect to have their boys produce a creditable finish when supplied with such material. Oil or spirit colors are not true solutions in the sense that sugar or salt dissolve in water. Their color particles are simply extremely finely divided which will explain in part why such uneven and streaking results attend their use. Very recently I have answered an inquiry where a piano finish was ruined by an oil stain coming up through the filler and blistering the varnish into thousands of tiny bubbles. The condition is practically impossible with water stains which, unlike oil or spirit soluble colors can, be mordanted, or "set," to prevent fading. Oil or spirit stains must be reduced in order to stain end grain portions, otherwise they will appear many shades too dark. This is not the case with water stain

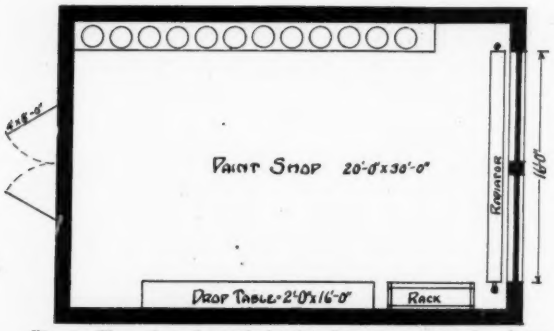


Fig. 4.—Floor plan of practical paint shop arrangement for classes of fifteen to twenty handling all classes of work. Avoid fastening down any equipment wherever possible.

since all grains shade up practically alike. In the case of oil soluble colors, there is a strong possibility that it will "bleed" up through the varnish thereby causing no end of trouble. Give your boys water stains of good quality and teach their correct use. (Reference may be made to article on stains in May, 1920 issue, Ind. Arts Mag.)

As a rule it is best to apply water stains as hot as possible. This will aid in penetration, the breaking up of air bubbles in porous wood, and speed up the drying. Wherever sapwood and heartwood show contrasting shades, the sap may be touched up by using a shading brush made by cutting an 1½" brush diagonally and then sanding the bristles with a block to bring them back to chisel shape again. It is obvious that the shorter bristles will carry much less stain than the longer ones and for that reason should be worked nearest the dark wood margin.

If staining will take more than an hour it is best to rub in vaseline or machine oil around the finger nails and base of the nails. Similar treatment of the rest of the hand will prevent unsightly hands. Care however must be exercised to avoid touching any work with greasy hands as the spot will either prevent stain from taking hold or if on stained work will darken it appreciably.

The stain should be allowed to dry four to five hours at 75° F. *without sanding.* If a brown stain has been used orange shellac should now be used as a *"size"* only. As the stock is supplied in gallon cans in the store it is sold on the basis of "four or five lb. cut." This means that for each gallon of alcohol used, four or five pounds of dry gum shellac are incorporated. When it is bought, therefore, inquiry should be made as to the "cut" in order to know the reduction it will stand. In practice shellac should never be employed to produce a finish (pattern making excepted) but should only be used as a sizing material to hold down the color and stiffen up any "whiskers" caused by the water stain. For this purpose reduce stock shellac with denatured alcohol so as to make a size carrying one and one-half to two lbs. of gum per gallon. Brush on very thin.

"Finishing sandpaper" may be either Flint or Garnet, preferably the latter, since the glue is generally better and the garnet grit is more lasting and less sharp than flint. When any doubt exists as to which of two papers should be purchased, that paper which retains its grit best when the two sanded sides are rubbed together, is the better grade, since the glue is stronger. Finishing papers begin at four "O" and run to ten "O" and are both single and double faced; the latter being a special paper ready to split (Fig. II a). For all classes of shellac and varnish sanding I much prefer six "O" double-surfaced, ready to split, garnet paper. The sheet should be torn into quarters and then eighths, which makes an economical and efficient size. Each end may then be split, and if held between the thumb and first finger the other finger ends form a firm pad for work. Most men prefer to have a small damp sponge at hand to keep the fingers moist and thereby enable them to get a better grip on the soft sandpaper. The whole value of the split paper lies in the fact that its extreme flexibility and softness enables the grit to take hold of the varnish and cut it clean without becoming glazed as readily happens when heavy unsplit stock is used. Those small glazed spots simply slip over the varnished surface and scratch while preventing the paper from taking hold. A split paper when properly used will sand an unbelievable amount of surface and for this reason should not be discarded too soon.

The shellac coat having dried at 75° F. while the paper is being prepared and split, should now be sanded glass smooth and thoroughly dusted off. By shellacing *before filling* oil absorption and change of color of the wood are prevented. The job is now ready for the filler.

Formerly it was quite the practice to use rye and barley flour as a base for filler compositions and, since it is frequently suggested that they be used today, it is pertinent at this time to point out the dangers attending their use. Under the microscope typical starch grains appear as hollow grains or spheres. When mixed with oil, drier, thinner, etc., these grains become filled and some swelling takes place due to absorption of small percentages of moisture. When forced into the pore, and consequent drying out during the hardening process, the filler made from starch grains shrinks and pulls away from the side of the pore. Eventually the grains give up all their oil, collapse and shrink enough to ruin the finish.

Improvements in machinery and methods have also brought improved materials. As a result we now can buy silex, or ground quartz rock, very cheaply. This forms an ideal filler base because it is inactive chemically and physically always retains its characteristic needle-like form, no matter how finely it may be ground. As it is applied in the liquid filler composition and forced into the pores, the drying and hardening process

Fig. 5.—Filling and cleaning up door panels. Boy at right is applying filler around panel line, then across the panel, next across the rails and then across the stiles. Boy at left is doing first rubbing off with burlap. Note ⅛" x 6" dowel rod on forward corner of door panel to be usel in cleaning up around panel lines. Sharpened to a skew chisel on left end and long point at right. If many panels are to be filled, it is advisable to tack a pine strip across the horses to avoid scratching the doors, etc.

causes the needles to settle into the pores, locking their points into the sides of the pores and thereby safeguarding any falling out.

Whether the wood be coarse and open-grained like oak, ash or chestnut, or close and fine-grained like birch, will determine the condition of the liquid filler. For coarse-grained woods twelve to fourteen pounds of silex dough per gallon of thinner, for close-grained woods eight to ten pounds will be required.

The best formula which I have ever seen offered for making a natural colored filler dough is one published by Walter K. Schmidt:

12 parts boiled linseed oil.
6 parts dark Japan drier.
1 part turpentine.

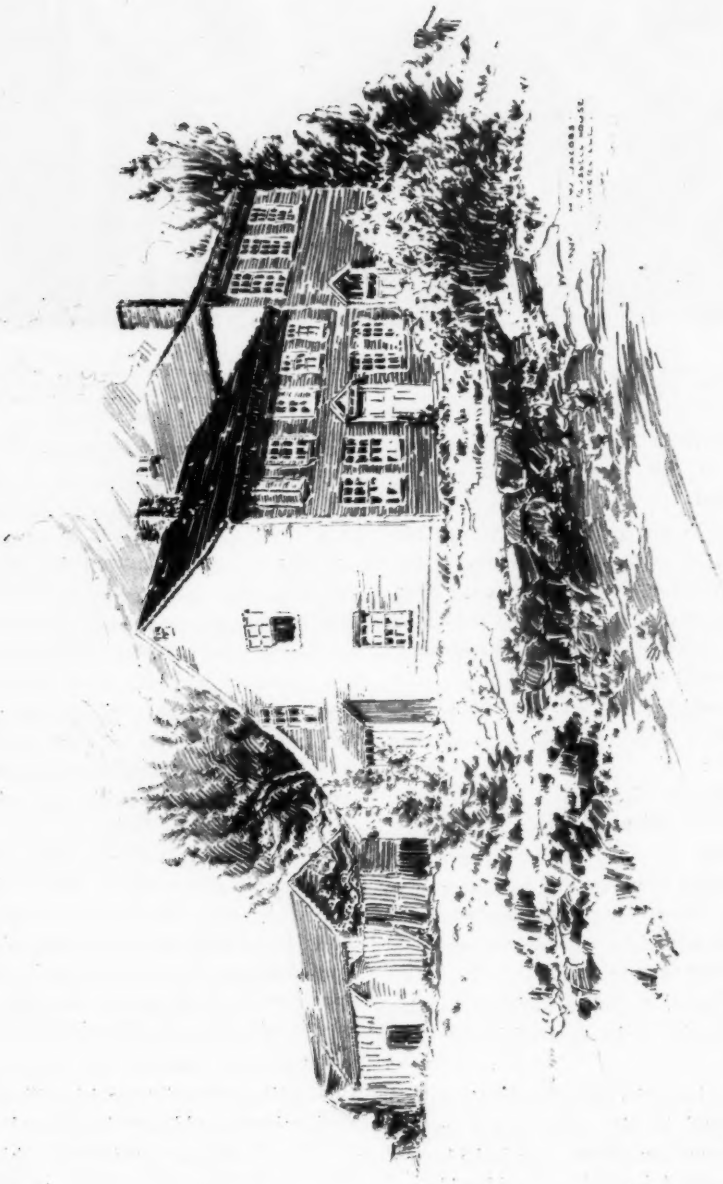
In each case, one part is one cupful, the above mixture will require 25 pounds of silex to make a stiff dough which should be kept in a covered can and portions cut up for use from time to time.

For thinning purposes I find two quarts benzine and one quart of turpentine to be about right for average conditions.

Filler when reduced may be tinted to match stained work with colors ground in oil. This would include French ochre, raw Sienna, raw umber, Van Dyke brown, rose lake, etc., all "ground in oil." Considerable experience is necessary to produce a given shade, but trial panels of known composition should afford a check for reference.

In applying fillers use a wide, short bristle brush, (Fig. IV), a worn-out paint brush with its bristles trimmed square is splendid for this work. Brush on the proper filler *across the grain.* In a room at 75° F. it should set not more than five minutes or until the gloss has disappeared. During this time a piece of flexible and smooth leather should be used to force the filler into the pores, working constantly across the grain. Use eight-inch squares of *clean* burlap or sacking *free from grit,* to clean up the remainder of the filler and then finish up the job with clean pieces of muslin, old shirting, etc. Avoid laying out too much filler ahead of the cleaning up or it will set hard and prove a nuisance. In case this occurs recoat the hardened portion with liquid filler and wipe up sooner than usual. For beads, fillets, panel lines, etc., a half-inch dowel rod, six inches long, sharpened to a round pencil point at one end and to a skew chisel shape on the other will prove a great help in cleaning up difficult portions.

Above all else be very thorough in cleaning up after filling otherwise the job will appear muddy. The whole piece should now be allowed 48 hours to dry at 75°-80° F. before varnishing, which subject will be taken up in the next article on *"Paint Shop Varnish Practice."*



AN OLD NEW ENGLAND LANDMARK: THE RUSSELL HOUSE.

Pencil Sketching

Part IV.

Harry W. Jacobs, Director Art Education, Buffalo, N. Y.

In this series of articles, the first of which appeared in the February issue of 1921, the art of Pencil Sketching is being presented. We have discussed in previous issues, materials and their manner of handling; the study of technique, leading to simple developments of parts of a subject; a study in the handling of strokes; followed by a discussion of the center of interest, an important factor in pencil sketching.

I know you will pardon the long intermission between articles. For you all know that any director of a city system has his hands full in the early part of the school year, and during the summer is engaged in some line of art activity. I hope so anyway, for during the vacation one should store up energy and ideas with their play for the next school year.

In this article we will consider methods of working, that is the development of a sketch.

I desire to suggest two methods of working, namely from light to dark, as in Plate A; and from dark to light, as in Plate B. I show two methods because you will find it to your advantage to work in both ways, adopting the method you think best for the subject selected.

As you watch the vast panorama of subjects to sketch, there are parts of your panorama that are more interesting than other parts. Selection, then, of subject, is of utmost importance, well worth plenty of time and thought as to the best vantage point and the hour which the sun makes its happiest play upon your subject. All this must be carefully planned and thought out before a line is drawn on paper.

After your selection has been made, the next thing is to search for its center of interest. This interest point is surrounded by the larger masses of darks, which catch your eye immediately. In succession the smaller and less interesting lighter masses which enhance the larger masses and the interest point is discovered.

In Plate A, the first method of working is illustrated, that of working from light tones to dark tones.

Once the subject is selected, draw lightly with a pencil the main or construction lines of the sketch. These lines should be kept as light as possible since they are to become a part of the finished sketch. Be careful to give the correct perspective drawing to the leading lines and outline of masses.

The selection of the center of interest, or focus point, must always be kept in mind and placed near the center, so that the leading lines of the picture will carry the eye toward this focus point, Fig. 1, Plate A.

At this stage examine the subject thoughtfully, note the direction of planes and the texture of material that the strokes must represent. With proper emphasis in mind, apply the flat gray tones with a 2H pencil, Fig. 2, Plate A.

The darker tones should then be added with the HB pencil, keeping in mind the fact that the work should be done simply, suggesting character of surfaces but omitting all detail. Fig. 3, Plate A.

The blacks in and about the center of interest (2B or 3B pencil) are then to be placed with the utmost care in order to get the strongest contrasts of light and dark and the sharpest details about the focus point. Fig. 4, Plate A.

Plate B illustrates a sketch rendered from dark values to light values, "A Street in Caudebec." Fig. 1 shows the light outline sketch. The darkest values, as near black as possible, were next located in the opening at the end of the street, with such dark grey masses as would lead to the black mass. Fig. 2. It is important to obtain the greatest contrasts of light and dark at this center of interest.

Fig. 3 shows the drawing of the dark masses with the HB pencil and the light masses with 3H pencil, noting the direction of strokes and texture of material, as in the shingles, bricks, cement and stone.

In Fig. 4 the sketch is to grow about the center of interest, detail being accented about this central zone, but gradually breaking into mass and line as the sketch grows away from the focus point. All lines and directions of strokes in the larger masses tend toward the center of interest and assist the eye to this focal point. Lines and masses are accented here and there by darks which relieves the eyes from jumping too quickly to the interest point—by gradually leading into the picture.

The page of notebook sketches shows a variety in subject and the rendering of many different strokes to show texture. Small sketches of this nature make excellent beginning sketches, since they are made quickly, are not labored and offer a record of a subject quickly drawn in a pocket notebook. One cannot fail, in using a notebook for quick sketches, to learn that simplicity and directness of handling, with strong contrasts at the center of interest make for the successful sketch. All of these sketches have strong interest points and in the Back Yard sketch a variety of strokes is shown to give different textures to materials drawn.

The sketch of the Russell House is an example of working from light to dark. This house built in the old New England period, with its many additions and quaint stone wall overgrown with bushes offers an interesting sketch to pencil draughtsmen.

① Suggestive sketch 2H or 3H pencil.

② Adding light value. 2H pencil.

③ Light values with dark value added, with HB pencil.

④ Accents, with center of interest emphasized by adding to light and dark values rendered.

H. M. J.

Plate A.

① OUTLINE SKETCH, 2H. PENCIL

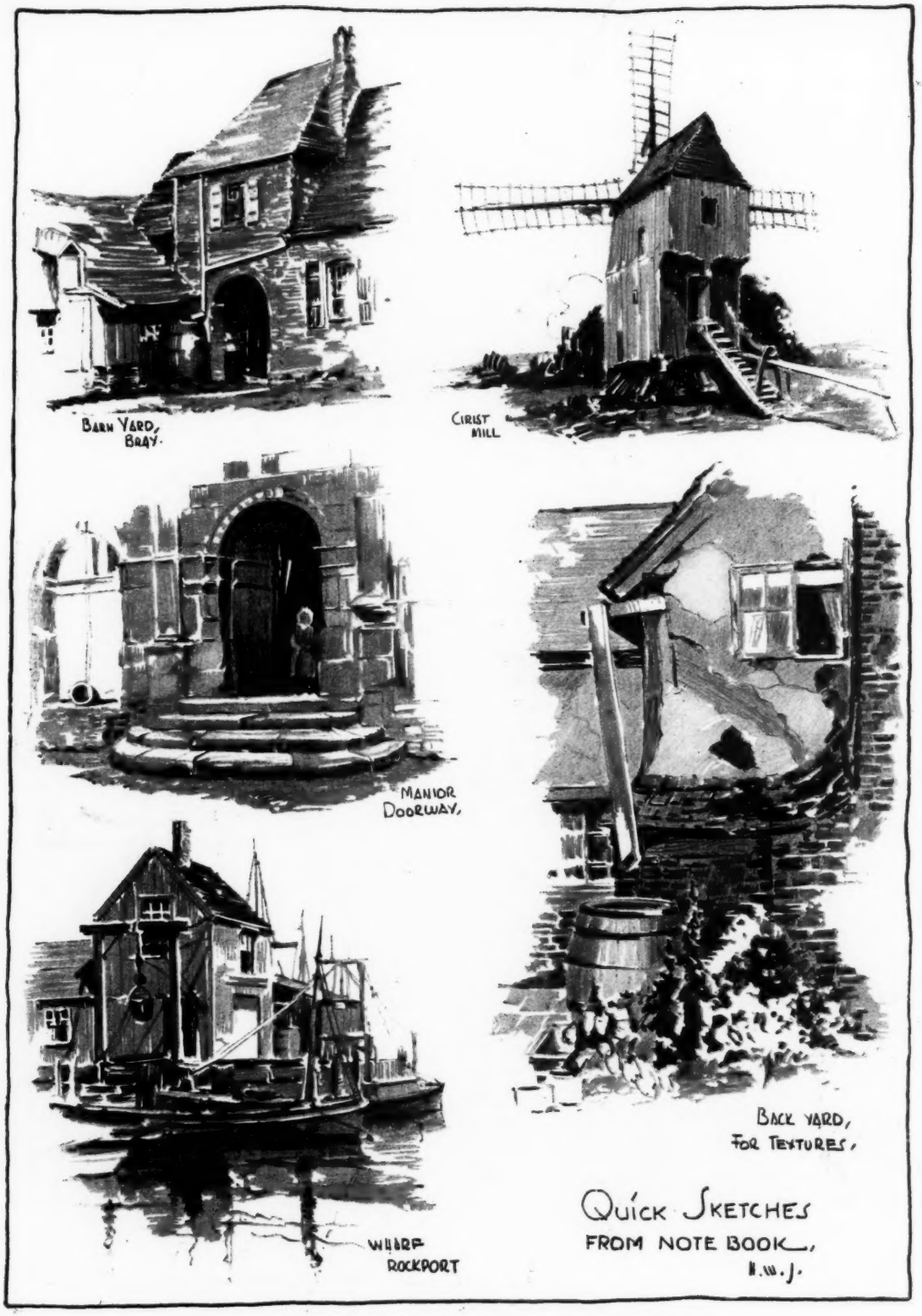
② DARKEST SPOTS, CENTER OF INTEREST, 2B OR 3B PENCIL.

③ LIGHT TONES - 3H
DARK TONES - HB
SURROUNDING CENTER OF INTEREST.

④ ACCENTS, EMPHASIZING CENTER OF INTEREST, SUBORDINATING ALL OTHER PARTS.

CALDEBECK

PLATE B.



TYPICAL QUICK PENCIL SKETCHES FROM THE AUTHOR'S NOTE BOOK.

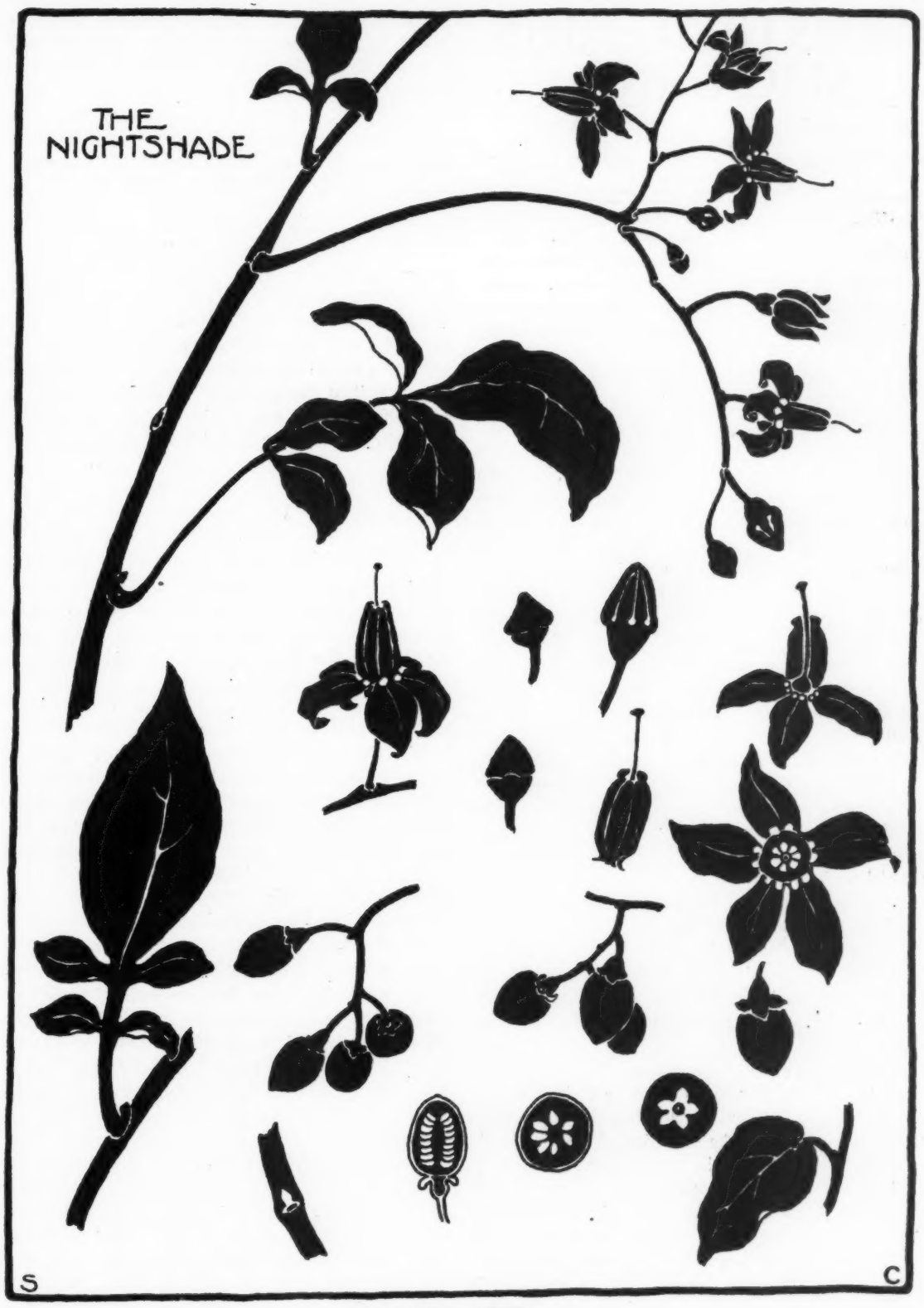


PLATE IV

STUDIES OF THE NIGHTSHADE, BY MISS SARA COHOON, INSTRUCTOR OF ART IN THE JUNIOR HIGH SCHOOL, SPRINGFIELD, MASS. THIS IS THE FOURTH OF A SERIES OF TWELVE PLATES.

INDUSTRIAL-ARTS MAGAZINE

E. J. LAKE S. J. VAUGHN
Editors

EDITORIAL

MANUAL TRAINING AND ITS NEW CHANCE.

In spite of both its friends and its foes, manual training is still thriving. In the past few years it has been neglected, disowned, apologized for, sinned against, and even attacked, but after all the excitement and confusion it may be found at the same old stand "sawing wood" as usual.

A good many teachers are now even willing to admit that they are manual training teachers and not vocational teachers after all. Only a short time ago, almost every village school that had any sort of a shop announced "vocational courses." Ridiculous things have been going on. One case comes to mind where a "vocational course in pattern making" was being offered in a village where the teacher was the only pattern maker employed, and he was employed as a teacher.

It's time now to get back to a good, sensible defense for manual training as a necessary part of every boy's education. In this age of loafing, when home duties for boys have disappeared, and when the ready-made world offers almost no constructive activities and no experiences that lead to industrial insight, there is imperative need for those shop activities that give contact with materials, that demand physical and mental adjustment to manipulations and processes, that lead unerringly from cause to effect, that require of the individual the most effective self-criticism and appraisement, and that finally give some notion of what the industrial work is like.

The development of the junior high school just at the time when people are coming to understand that the major portion of the shopwork in most high schools cannot be, and should not be, definitely vocational, offers the most wonderful field for the modern, enriched, variegated courses in manual training or the industrial arts.

This is not a plea for a return to the old cut-and-dried manual training of 25 years ago. It is a plea for the introduction and development of shop courses as an essential part of the education of boys in the elementary and high schools without any necessary regard to the future occupations of such boys. Such courses should be used so far as possible for guidance purposes, but if a boy had already chosen *law* as his future profession, that would be no reason for excluding him from the shop courses. On the contrary, it would be a most important reason for insisting that *he* should have the breadth of contact and experience that such courses alone can give.

There should, of course, be definite vocational courses for the comparatively few who will take them in most high schools, but the plea here is for a return to manual training courses in their proper places, called by their right name, and taught by teachers who do not care to disguise themselves as "vocational teachers."

THE RELATION OF THE NATIONAL SOCIETY TO OTHER VOCATIONAL ASSOCIATIONS.

Ever since the passage of the Smith-Hughes Law there has been much speculation at to the future of the National Society for Vocational Education. This organization, as everyone knows, had a long and successful career as the National Society for the Promotion of Industrial Education. To it and a few of its leaders, who had the backing of some wealthy friends of the movement, is due the enactment of the Smith-Hughes Law as well as the legislation in many of the states. After this objective was attained, there was considerable feeling that the work of this organization had been finished.

Following numerous conferences and discussions, it was finally decided to continue the organization under the much broader name that it now bears and to use its prestige and influence in furthering the interests of this essential type of education.

In very recent years, the Society has found itself in competition with another organization, the Vocational Education Association of the Middle West, by virtue of the fact that it has held its annual meetings in the Middle West and at a time very near that of the Mid-West meeting. The competition, although not intended, has nevertheless become very real. Since the Middle-Western Association leaders have all along been ardent members and supporters of the National Society, it naturally developed that the Mid-West meetings have been fully equal, and some think in many ways superior, to those of the National Society. From the mere standpoint of meetings, attendance, programs, etc., the two associations have covered quite similar, if not the same, ground.

There is a rather well defined impression abroad that the time has come when the National Society can draw a large and representative attendance only when the meeting is held in the Middle West. The INDUSTRIAL ARTS MAGAZINE shares with the Manual Training Magazine the opinion that something must be done to remove the element of competition between these two organizations.

Some time ago, Dr. Prosser in a conference with leaders of the Vocational Association of the Middle West, voiced the desire for some sort of a scheme that would make the National Society a kind of delegate body whose delegates might be sent from regional associations such as that of the Middle West. Others have followed this with a proposal to have the National Society meet each year with some regional association in a spirit of cooperation and helpful conference.

Such a scheme on the broad lines mentioned above has in it the thoroughly American principles of coordination and representation that will encourage strong regional organizations and yet save the National Society as a clearing house for all the groups that may be formed in the different sections of the country. We trust that some solution may be found that will prolong the usefulness of the National Society and at the same time give encouragement and assistance to any regional organization that can perform a needed service.

SUPPORTING OUR ORGANIZATION.

Every teacher should consider membership in one or more organizations related to their work as necessary to successful teaching.

Membership entails more than the paying of a membership fee and the acceptance of benefits. Each year we are confronted with the dilemma of school organizations which attempt to sustain membership by the devoted interest of a few "honored officers."

One solution of this difficulty is given by a successful minister who says, "I find it necessary to give every person in my church something definite to do for the church before he becomes a good church member." Confession of need and acceptance of benefits have never been adequate installation for a member in good standing. This idea of giving every member something to do is the secret of executive ability though it is not always the best way to get things done quickly and well. There is a proverb of organizations to the effect that "Committees work effectively in inverse ratio to their size." Also we are reminded that "if you want a thing well done, do it yourself." In the organization that seems lagging we believe a little more of the preacher's method is advisable even though some members shirk their duties. Perhaps the appointment of an employment bureau would insure activity. Let this bureau be composed of persons of a variety of interests charged with the obligation of finding something for every member to do. Let the motto of the organization be "no innocent bystanders." It is evident that the chronic ailment of organizations is the indifference of members who join to be served rather than to serve.

MAINTAINING THE PROPER BALANCE IN DRAWING AND DESIGN.

We trust that the reaction now setting in all along the line of school work may not lead teachers of art to reduce their efforts in the direction of good design. For a long time the drawing and art work in the schools took the direction of the pictorial and the ornate. In recent years, however, the tendency has been toward design and the decorative in the development of correlated courses in the industrial arts. Indeed there has been some danger of undervaluing the importance of *drawing* as a matter of representation.

The reaction will naturally swing back toward the pictorial with the emphasis on the technique of drawing. The danger is that after the recent riot of individuality and originality another period of copying and dictation may reappear, thus combining and emphasizing a number of practices that have taken a long, hard struggle to adjust to their proper places.

There is a perfectly proper balance that should be maintained in school courses between the pictorial and the decorative, between the original and the copied, and between drawing for skill in representation and design for application. Any tendency to swing away from this balance in any direction is unfortunate. We hope that the interest developed during the last few years in the decorative arts and in the socalled applied design, may not diminish, but that along with the interest in design there shall always go interest in drawing and the ability to draw.

MACHINE OR HAND-MADE.

Americans lack fine craftsmanship and the appreciation of it. Conditions of life and industry in America do not develop craftsmanship that compares with the handwork done when fine things were hand-made.

It is idle, however, to lament over unfortunate results of changed conditions when the general results are favorable. Who would revert to the social conditions of the middle ages in order that fine craftsmanship might prevail?

Our commodities are now machine made in quantities and at cost that makes it possible for most people to live in comparative luxury. Though inferior in craftsmanship, these modern commodities are not less useful than the old hand-made products.

In general the modern manufactured product is better adapted to use and less ornamental than the old time hand-made product.

Hand-sewed; hand-carved; hand-painted; handmade are expressions that imply the thorough, painstaking execution of a trained individual and are used as selling inducements on that impression.

In fact the hand-made article of the present time is liable to be poorly made and poorly designed. Much of the hand-made stuff sold to American tourists abroad are not only bad in design but flimsy in material and execution. Americans are the victims of the hand-made hoax both at home and abroad.

It is high time that art instructors in America devoted their teaching to the qualities that are inherent in the materials, methods and uses of manufactured, machine made goods. It is futile to anticipate a revival of hand-made goods and the craftsmanship that is developed by handwork. Let us learn the merits peculiar to well made, machine made, but humanly designed products. Let us be careful to avoid the imitation of hand-made products in the design of machine made goods and let us develop our aesthetic appreciation of design consistent with material, method and use. With the aid of science the form, color and texture of machine-made products can be adapted to aesthetic standards, with more beautiful results than was possible to the medieval workman.

Eastern Arts Association

Rochester, N. Y., April 6, 7 and 8

Leon L. Winslow, Albany, N. Y.

The Eastern Arts Association including sections for teachers and supervisors of art, industrial arts, vocational subjects, home economics, part-time work and teacher-training met in convention at Rochester on April 6, 7 and 8. Convention headquarters were at the Hotel Powers; the meetings and the educational and commercial exhibits were centralized at the new Madison High School Building.

This was the thirteenth annual convention of the Association and in the opinion of many of the delegates present it was the most successful of all. The sectional meetings had been organized to meet the specific needs of the various branches of education represented. This arrangement served to attract specialists of national reputation, and it gave each delegate an opportunity to secure help in his particular field of work.

The program committee consisted of: Frances H. Bacheler, Public High School, Hartford, Connecticut, Chairman; Arthur F. Hopper, Plainfield, New Jersey Public Schools, Leon L. Winslow, New York State department of Education, Albany, and Irene E. McDermott, Public Schools, Pittsburgh, Pennsylvania.

The local committee consisted of: James F. Barker, Assistant Superintendent of Schools, Rochester, N. Y.; Chairman, and Helen E. Lucas, Director of Art Education, Rochester, New York; Secretary-Treasurer.

Assisting the local committee were twelve sub- committees under the immediate direction of various members of the superivsory and teaching staff of the Rochester Public Schools. These committees had in charge registration and local membership, hospitality, accommodations and transportation, program publication, school exhibits, commercial exhibits, membership exhibits, music, points of interest, finance and business, museums and art exhibits, and luncheons.

Attendance and Exhibits.

Never before in the history of the organization were the interests of the delegates better provided for. There were sections for elementary teachers, junior and senior high school teachers, and special teachers in various industrial and art subjects and there were attractive general meetings equally interesting to all.

The attendance included delegates from all of the eastern states among whom were noticeable an unusually large number of new members, young men and women with enthusiasm for better organization of their instruction and anxious to secure the benefits of the experience of the older members. Nine ex-presidents of the Association were in attendance, presidents who had in past years "builded better than they knew." Never was there a higher type of good fellowship. The publicity methods of the past year had resulted in increasing the paid-up membership from 508 to over 800, or about sixty per cent increase. Nearly one thousand people were registered.

The exhibits were unusually helpful. The school exhibits gave a birds-eye view of eastern art education which would be difficult to duplicate. The commercial exhibits were never so full of new ideas and inspiration. There were in all eighteen educational exhibits and 29 commercial exhibits, making a total of 47 in all.

Music was an important feature of the convention. The combined orchestra of the East and West High Schools of Rochester, consisting of a hundred pieces, rendered the orchestral selections; the vocal numbers furnished at the banquet were given by high school pupils. All music was in charge of Charles F. Miller, director of music in the Rochester Schools.

Service of the Officers.

The success of the convention was due to the untiring energy of President Fred P. Reagle, assistant superintendent of schools, Montclair, New Jersey, and the able assistance and cooperation rendered by Frances H. Bacheler, the vice-president; Frank E. Mathewson of the William L. Dickinson High School, Jersey City, New Jersey, the secretary; and A. H. Wentworth of the board of education, New Haven, Connecticut, the Treasurer. The officers received the undivided cooperation of the local committee and its subcommittees.

It is with justified confidence that the association looks forward to an equally successful meeting next year at Providence, Rhode Island, for, Frances H. Bacheler, director of art education, Hartford, Connecticut, the present vice-president was elected President for 1922-1923 and Frank E. Mathewson, through whose excellent publicity work the association is largely indebted for its increased membership and interest was elected to succeed himself as secretary. This publicity work directed by Mr. Mathewson was certainly a powerful factor in the convention's success. A newsletter was issued each month which kept the members informed as to the progress of the Association in its plans made for the convention. (It will be of interest to members of the association to know that the Newsletter will be issued monthly with a different artistic cover design each month made by a member of the Association.) Mr. A. H. Wentworth was elected to succeed himself as treasurer of the Association. The new, vice-president is E. A. Reuther state director of continuation schools, Trenton, New Jersey.

The new council members elected to serve for a period of three years are: Augustus S. Rose, Rhode Island School of Design, Providence, Rhode Island; Frederick W. Putman, Technical High School, Providence, Rhode Island, and, E. A. Cherry, Stanley, Rule & Level Company, New Britian, Connecticut.

The retiring council members replaced by the election of the men whose names are given above are: Edward C. Newell, Springfield, Massachusetts; Helen E. Lucas, Rochester, New York; Theodore H. Pond, Baltimore, Maryland, and Edward C. Emerson, *ex-officio*, Boston, Massachusetts.

The Program.

A summary report on the program follows: The convention proper was preceded on Wednesday evening by a dinner and conference of shop teachers and supervisors at the Powers Hotel. Dr. W. T. Bawden, assistant commissioner of education, United States Bureau of Education, Washington, D. C., was chairman of the conference, the subject of which was "Measuring the Student's Progress in Shopwork." About forty teachers were expected to attend. When this number was tripled the doors had to be closed. The conference proved to be an appropriate introduction for the convention. So great was the help derived from this stimulating and informal meeting that many requested the consideration of opening governmental conferences as a permanent feature of future conventions. The discussions at this meeting centered about the idea that "the successful teacher visualizes a definite goal to be reached, formulates some means of measuring the progress he is making toward the goal and adopts some method of determining when he has arrived."

Mr. Robert H. Rodgers, specialist in industrial education and teacher-training in the New York State Department of Education, stated some of the objectives to

be realized. He introduced his remarks by stating that shopwork is now recognized as a permanent part of the curriculum justified on general grounds of its contributing valuable educational experiences varying according to established objectives. He said that the determination and recording of students' progress in terms of the accomplishment of specific objectives is essential to effective instruction. Established objectives, he held, would be a first requisite for measuring a student's progress. For school work of any kind offered without well

FRANCES H. BACHELER,
Hartford, Conn.
President-Elect, E. A. A.

defined and explicit objectives must be aimless and ineffectual. Objectives for the various kinds of shop work, be held, should be variable; variability depending on certain common factors; capacity and interests of students; time, equipment, and the facilities available. Mr. Rodgers maintained further that the providing of means to attain the objectives is a requisite for student progress. His discussion from this point on dealt with outlines of instructional material, the organization of units of instruction, special teaching methods and efficient class management. Mr. William E. Roberts, supervisor of manual training, Cleveland, Ohio, presented some methods of recording completion of successful portions of work and measures to prevent omission of essential factors. Verne A. Bird, director of vocational education, Utica, New York, suggested some objective tests of performance of attainment. He called attention to the fact that the standardized subject test is more applicable to shop work than the general intelligence test. An open discussion followed and a summary was presented by Professor A. D. Dean of Teachers College.

First General Session.

The opening of the first general session of the convention took place on Thursday morning when President Fred P. Reagle introduced Doctor Herbert S. Weet, superintendent department of public instruction, Rochester who gave the delegates a cordial welcome in an inspiring address. A brief response of acceptance was made by President Reagle. The second address of the morning was given by Dr. Arthur D. Dean who chose for his subject, "Dedicated to the Spirit of Adolescent Youth." His address centered about a discussion of the junior high school. Doctor Dean began by saying that few know what is back of the junior high school idea. Then he entered into a discussion of what constitutes the junior high school, differentiating between the real junior high school and the so-called schools of that type. He said that there are hundreds of junior high schools in name but only about ten in all the United States that are true to their name.

"The junior high school," said Doctor Dean, "is not a glorified grammar school nor is it a supplementary senior high school nor a merging for economy of grammar and senior high classes taught by teachers paid grammar school salaries.

The speaker then discussed the spirit of the junior high school saying that it is best revealed in the 65 clubs at Washington Junior High in Rochester and that the junior high is a new and wonderful market place where all the outside world's best things are brought and distributed to adolescent youth. Doctor Dean said that if he had his way every junior high school would have over its front entrance *"Dedicated to the Spirit of Adolescent Youth"* and in its rooms and corridors there would be no pictures of Greek and Roman ruins but pictures depicting the spirit of youth, and he would have all the decorations bear out that idea, "for," he said, "If there is ever a time when God comes close to men it is in adolescent youth." He mentioned as other places where there are true types of junior high schools, Montclair, Trenton, Los Angeles and St. Louis.

In discussing the subject "Organization of the arts in a Junior High School," Mr. Arthur Irving, Principal of the Buckingham Junior High School, Springfield, Massachusetts, emphasized his points by frequent illusions to the junior high school work as it is being carried on under his supervision in the City of Springfield.

Importance of the Teaching Profession.

The closing address of the morning was given by Doctor A. R. Brubacher, President of the New York State College for Teachers, Albany, New York. This address was inspirational in character. The speaker succeeded in convincing the audience of the supreme importance of teaching as a profession. Doctor Brubach-

FRED P. REAGLE,
Montclair, N. J.
Retiring President, E. A. A.

er's address may be briefly summarized as follows:

"Recognition is the best measure of the value of any service. In the case of teaching, this recognition may be financial, social or professional. The financial recognition has in recent years seen vast improvement. Initial salaries have increased more than three hundred per cent. Unfortunately, however, the salaries now paid to teachers who have seen long service have not increased proportionately. Teachers of twenty or more years of experience, are in numerous instances teaching for almost the

same salaries that are now paid to teachers in their first or second year of experience, that is, the financial recognition is uneven and therefore unsatisfactory.

"The teacher occupies a place of strategic importance in social evolution. There is a continual tendency to mutation in human conduct. The communist, the socialist and the individualist each tries to give permanence to his variation from recognized social standards. Without the conserving influence of tradition these social tangents tend toward revolution. It is the teacher's business to select what has been found good and true and lovely in human society and transmit it to the next generation. Herein lies much of the nobility which attaches to the teacher's work. Without the teacher, civilization cannot maintain its level.

"The members of the teaching profession should form a higher conception of their service. They should recognize their places in the general scheme of things and should accept their responsibility as custodians of tradition, as the conservators of civilization itself."

The second general session was a banquet meeting held at the Powers Hotel on Thursday evening. After the repast, President Reagle introduced the following after-dinner speakers: Dr. Herbert S. Weet of Rochester; Prof. Martha Van Rensselaer, School of Home Economics, Cornell University; Professor L. W. Kline of Skidmore School of Arts, Saratoga Springs, New York. These speakers were assigned ten minutes each. Then followed thirty-minute talks by Hugo B. Froelich, director of manual arts, Newark, New Jersey; Prof. Charles F. Binns, Alfred University, Alfred, New York; and Royal B. Farnum of Boston, principal of the Massachusetts Normal Art School and director of art for Massachusetts.

The Banquet Addresses.

Mr. Froehlich chose to speak on the subject, "Vital Topics in Art for Junior High Schools." He offered a course of study organized on the "alternating plan" indicating that by the alternating plan is meant an arrangement whereby two schools operate as one in one building, one school or group of classes being engaged in academic work while the other group is engaged in activities, including art, manual training, printing, sewing, cooking, gymnasium, etc. "Under this plan the pupils of the seventh, eighth and ninth grades received daily lessons in art of eighty minutes each for five days a week and for ten weeks a year making 64 hours of intensive art instruction per year. The year is divided into four cycles of ten weeks each. Art thus receives one cycle; manual training and cooking, one; printing and sewing, one; etc.

This intensive method of teaching has proven to great advantage over the older method of teaching in periods occurring once or twice a week and distributed throughout the year. Of the 66 hours of the cycle, probably six hours of instruction are lost because of time taken for organization, examinations, holidays, etc. This leaves us about sixty hours of time to be devoted to art instruction."

The speaker then entered into a discussion of the subject matter of the junior high school art course treating briefly the following topics to which he assigned the number of hours indicated. Color and design, 15 hours; drawing including nature, object and perspective drawing, 15 hours; commercial design, ten hours; interior decoration, ten hours; and design in dress, ten hours.

Prof. Binns gave a brief analysis of the pottery industry and indicated the adaptability of this craft to instruction in the junior high school, his subject being, "The Introduction of a Practical Pottery Course in the Junior High School."

Mr. Farnum discussed "Art Education in Its Relation to the Junior High School." He successfully pointed out the relationship which should exist between art education and the junior high school organization interpreting the meaning of art education in its broadest sense and showing how it may help to realize the big objectives of education. In the course of his address Mr. Farnum offered many constructive suggestions which will be helpful to the supervisor and teacher of art subjects.

The Third Session.

The third general session was held at the Chamber of Commerce Building on Friday evening. The address of the evening was given by Frank Alvah Parsons, president of the New York School of Fine and Applied Art and professor of advertising display, New York University. Mr. Parsons presented in a very entertaining and attractive way his theories underlying the relationship existing between art and life, pointing out at the same time the relationship which should exist in America between practical art and everyday life. His remarks were illustrated by numerous illusions to situations and experiences upon which his theories are based. Mr. Parsons' theories are more than theories. They represent experience and are, therefore, in the strictest sense conclusions, which enable those who possess them to act in accordance with art principles in "doing the common things of life uncommonly well."

Thursday and Friday afternoons were given over to sectional meetings. There were two art sections, the first of which, in charge of Helen E. Lucas, Director of Art Education, Rochester, was held at the Madison Junior High School. At this meeting Orel L. Adams, gave a paper on "Problems in Design in Junior High Schools". Alexander E. O. Munsell of New York discussed "Color and design in Senior High Schools," pointing out the advantages of the Munsell Color System and explaining its practical use in instruction. The subject of color was treated further in the paper of Marguerite Marquart, art supervisor at Newark, New Jersey. Miss E. H. Salmon, art supervisor, New Castle, Pennsylvania, contributed a paper on "Creating Community Interests in Art Instruction."

The second art section was in charge of Harry W. Jacobs, director of art education, Buffalo, New York. Papers were contributed by A. W. Abrams, director of the division of visual instruction, University of the State of New York, Albany, William H. Varnum, assistant professor of applied arts, University of Wisconsin, and Ernest W. Watson of Pratt Institute.

Mr. Abrams took as his subject "Visual Aid in the Study of American Art," illustrating his paper with stereopticon which was also used by Mr. Watson in his excellent presentation of "Posters and their Making." Mr. Varnum chose as his subject "Color and Design in Junior High Schools."

Industrial Arts Section.

The two sections on industrial arts for junior high schools were in charge of Arthur F. Hopper, director of manual and fine arts, Plainfield, New Jersey and Verne A. Bird, director of Vocational education, Utica. Mr. Hopper's section met on Thursday and Mr. Bird's section on Friday. The program for the former consisted of the following: "Industrial Arts in Junior High Schools," R. K. Savage, Jefferson Junior High School Rochester; "How to Do it," Doctor Arthur D. Dean, professor of vocational education, Teachers College, Columbia University; and "Suggestions for Closer Coordination of the Academic Work and the Shopwork in Junior High Schools." William R. Ward, director of industrial arts, Trenton, New Jersey.

The program for Mr. Bird's section consisted of the following: "The Aims and Purposes of Industrial Arts in Junior High Schools", Robert A. Campbell, assistant in industrial education, State Department of New Jersey; "Use of the Incentives to learn," Warren Atkinson, Rochester Shop School; and "A State Program for Junior High School Industrial Arts", Leon L. Winslow, specialist in art and industrial arts education, New York State Department of Education.

Two household arts sectional meetings were in charge of Irene E. McDermott of the Department of household economy, Pittsburgh, Pa. Both meetings were well attended. On Thursday afternoon C. E. Kellog, principal of Washington Junior High School of Rochester, gave an inspiring talk on "The Girl's Opportunity in the Junior High School." Some helpful suggestions on "Improvement of Teachers in Service" were presented by Marion F. Burns, assistant professor of teacher training in vocational home economics of the Pennsylvania State College. Miss Treva Kauffman of the New York State Department of Education read a paper which had been prepared by Florence Freer of the Home Bureau of the Rochester Chamber of Commerce entitled "Linking the High School Training with the Home." Miss Emma Conley, state supervisor of home economics in the New York State Department of Education, contributed the first paper at the Friday afternoon meeting. Her subject was "Elective Courses in Home Economics, for Girls in Senior High Schools." She told of the established junior high school courses of a general nature which gave the way for the more specialized senior high school work designed to prepare girls for home management or which lead directly into the trades of dressmaking, millinery, catering and lunch room management. The second and last speaker was Martha Van Rensselaer of the School of Home Economics, New York State College of Agriculture, Cornell University. Miss Van Rensselaer's subject was "The Evaluation of a Housekeeper's Time."

The Place of Industrial Arts.

The two elementary industrial arts sections were in charge of Leon L. Winslow of the New York State Department of Education and George F. Hatch of the Department of Manual Arts, Boston, respectively. The speakers at Mr. Winslow's meeting were F. G. Bonser, Professor of elementary education, Teachers College, Columbia University, Edwin L. Taylor, director of Industrial arts, State Normal School, Plattsburg, New York, Lillia M. Olcott, director of Drawing, State Normal School, Cortland, New York, and Jane B. Welling, assistant art supervisor, Grand Rapids, Michigan. The general topic under consideration at the meeting was "The Place of Industrial Arts in the Elementary Curriculum and the Administration of the Courses." The chief speaker was Dr. Bonser from whose paper on "The Place of Industrial Arts in the Elementary Curriculum," we quote three closing paragraphs. His paper was, without doubt one of the strongest and most valuable presented at the convention. The next three paragraphs are from Dr. Bonser's paper.

"Relative to the whole work of the elementary school, the place of industrial arts is proportionate to the place which the problems in properly supplying ourselves with material products bear to the problem of life as a whole. In any good school, the emphasis upon each phase of its work is proportionate to the importance of that phase in life itself.

"I have tried to indicate that problems of health, of economy, of the enjoyment of beauty in our sourroundings, and of many phases of citizenship are included in the proper study of the industries. These are all very large problems in our daily lives. Over four fifths of all of the work of the world is devoted to supplying us with the material products afforded by the industries and the closely related occupations. If it is important that the life of man should be lived in health and strength, with all of the comforts to satisfy his every material need, surrounded by products of harmony and beauty, and intelligently efficient in cooperating with his fellowmen to secure the highest well being to all, then the study of industrial arts has a large place in the elementary school. From the point of view also of developing the capacities and powers of children for clear thinking, independent self-direction, resourcefulness, and an appreciation of the meaning and beauty of efficient life lived in wholesome and happy surroundings, no subject has greater potential possibilities than industrial arts. Its richness is the wealth of interest and value which make for finer efficiency and greater abundance of life itself.

"I commend the subject to your consideration on the basis of measurable values. These values are measurable in terms of actual improvement in the quality of our standards of living, both in utility and beauty. They are measurable in terms of the quality of our intellectual interests and the excellence of cooperation in our citizenship. An appeal upon any other basis would betray the high purpose which this field may justly claim for itself in promoting the good life—the life of service and self realization."

The speakers at Mr. Hatch's section were Blanche H. Woodford, supervisor of Drawing, Jamestown, New York, Charles B. Bradley, head of the art department, State Normal School, Buffalo, New York; Joseph Wisseltier, director of art, New Britain, Connecticut; and Rilla E. Jackman, professor of the theory and practice of teaching art, Syracuse University. The general topic of the meeting was "Industrial Arts for Industry and Art Appreciation."

Part-Time Conferences.

The two part-time education sections were in charge of Oakley Furney, specialist in part-time education, New York State Department of Education, Albany, and E. A. Reuther, state director of continuation schools, Trenton, New Jersey. The first speaker at Mr. Furney's section was E. E. Gunn, junior state supervisor, trade and industrial division, Madison, Wisconsin, who discussed "The New Apprenticeship and Part-time Education" describing the organization and operation of the Wisconsin apprentice law and making clear the fact that an apprentice program is an essential adjunct of any complete educational scheme since it affords an opportunity for the placement of boys in industry. The second speaker, Howard G. Burge of New York City, presented some interesting statistical material on "What We Know about the Employed Boys of the State of New York," based on the study recently made under his direction as head of the New York State Military Training Commission. The third speaker, Mrs. Anna. L. Burdick of the Federal Board for Vocational Education, gave an address on "The Need for Industrial Courses for Permit Girls in Part-time School." The last speaker of the section Wendell Nelson of the Executive office of the Industrial Service Department of the General Electric Company, Schenectady, said that employers are not yet convinced of the value of the part-time school as an educational agency although they are convinced of its value in ascertaining a boy's abilities and capacities along industrial lines. This factor has already proved of great value to the General Electric's plant in Schenectady. Mr. Nelson's subject was "The Employer and Part-time Education."

Mr. Reuther's section considered some of the administrative and instructional aspects of part-time education. R. H. Rodgers, specialist in industrial education and teacher training, New York State Department of Education, Albany, made a plea for the use of individual instruction sheets in part-time classes. Speaking of the job instruction sheet as a practical method of providing the much needed individual instruction Mr. Rodgers said,

"The job instruction sheet is presented as a device to enable the teacher to measure up to the needs of the job in the part-time school. It cannot be conceived how any teacher could put through a program of educational work under the conditions specified and have it terminate successfully without making use of individual instruction sheets of some form.

"Job instruction sheets should be organized on the unit plan. A job may be the basis of organization, or preferably, an operation or group of operations. The latter is recommended in that it will provide a very definite piece of work for a given class period.

"The unit plan incorporates not only the occupational activities but all the work offered in the school. It includes the practical operations of the job, the related drawing, science and mathematics and also the English,

the history, civics, economics and hygiene. The vocational work is the core and from it the major part of the subject matter is developed. By this plan the shop work serves to motivate and vitalize the more academic phases of the instruction.

"The plan to be followed in organizing job instruction sheets must adhere to certain fundamental pedagogical principles. First, beginning sheets may properly be very complete with specific directions for each step but later sheets should afford the fullest possible opportunity for self-activity. The work should be set up in the form calling for the best efforts of the students. Second, practical jobs should be selected from the occupational activities and these in turn carefully analyzed and sheets prepared on the basis of the learning difficulties involved."

Other speakers at Mr. Reuther's section were Adelaide F. Baylor, federal agent, home economics education, Federal Board of Vocational Education, Washington, D. C. who discussed "Home Economics in the Part-time School," Elizabeth Whitman, principal, Continuation School, Hackensack, New Jersey, who presented a paper on "All Time Guidance from the part-time School" and Charles Hamilton of the Charlotte High School, Rochester, New York, who presented a paper on "Teaching Problems in Commercial Work for Part-time Classes." Mr. Hamilton emphasized the fact that commercial education has outgrown the bookkeeping and stenography state and must now deal with actual office practice.

One feature of the convention which attracted considerable favorable comment was the arrangement for dinners alumni of teacher training institutions and other organizations. These dinners took place at various restaurants and local club houses, and were well attended. The organizations for whom arrangements had been made by the committees in charge included Mechanics Institute alumni, Massachusetts Normal Art School alumni, Pratt Institute alumni, New York State Teachers of Art and Industrial Arts, Pennsylvania Teachers of Art and the Vocational Arts Association of the State of New Jersey.

Vocational Section.

The two vocational sections were well attended and the programs were unusually strong. The chairman of the Thursday afternoon meeting was Lewis A. Wilson, director of vocational and extension education, New York State Department of Education. The speakers at this section were Doctor F. Theodore Struck, assistant director of vocational education for Pennsylvania, who contributed a paper on "Present Tendencies in Vocational Education," and Francis W. Wing, director of vocational education, Buffalo, who presented "Some Phases of Supervision.

One of the most important contributions to the vocational program on Friday, in charge of E. A. T. Hapgood, director of vocational education, Albany, was made by E. E. Gunn, junior state supervisor of vocational education, Madison, Wisconsin. In conclusion, Mr. Gunn made the following forceful statement of objectives:

"Part-time courses both in day and evening schools are being provided for adult workers throughout the country, where they may get that special assistance which they require. Specific courses in trade and industrial branches, commercial pursuits, homemaking and agriculture are being offered to meet the needs of people in these various fields. The proponents of vocational education with a vision of the future are everywhere striving to make it possible for the working boy or girl and the working man and woman to achieve their ambitions by offering educational opportunity in such a way that the instruction can be taken at a period when there is the most need for it.

"Vocational education has already succeeded in breaking down many of the strict conventions which previously surrounded our educational institutions. It has caused a broadening of the educational facilities offered and extended opportunities to thousands heretofore neglected.

"The time is not far distant when, through its agency, everyone who so desires will be able to stabilize his foothold in the upward climb and prepare himself for the next step forward. To hasten the coming of this time, through reenforcing its present program and opening up new and wider avenues of approach for the working boys and girls of this country, is the dominant purpose of vocational education."

ARTHUR F. HOPPER,
Hackensack, N. J.
President, New Jersey Vocational and Arts Association.

Other speakers at Mr. Hapgood's section were H. H. Stewart, director of Industrial arts, Mount Vernon, New York, who chose to speak on "Individual Instruction and Records of Individual Progress in a Unit Trade School," G. W. Burridge, director of Springfield vocational school, Springfield, Massachusetts, who pointed out the necessity of "A Place in our Educational System for the All Day Trade School," and Edward T. Welsh, coordinator for the vocational schools of Buffalo, who spoke on "Recruiting, Placement and Follow-up of Vocational Students." The program suggested by Mr. Welsh was practical and helpful and was well received by those present who are attempting to make their vocational work tie up closely with actual industrial life outside of school.

The fourth and last general session was held on Saturday morning at the Madison Junior High School. At this meeting there was a short business session and addresses by Esther L. McNellis of Boston, who spoke on "Follow-up Work in the Continuation School," and Merrit W. Haynes of the United Typothetae of America, Chicago, who spoke on "An Educational Enterprise of a Great Industry," Mr. Haynes's address was followed by the reports of special committees and by adjournment.

NEW JERSEY MEETING.

The New Jersey Vocational and Arts Association has made plans for an active year of work. Plans are under way for two meetings during the ensuing year; the first one to take place at Rutgers in the Fall, and the second to be held in the Spring at a center to be announced later. It is expected that this will be one of the most successful years in the history of the association.

The Society has voted to become affiliated with the National Society for Vocational Education.

PROBLEMS AND PROJECTS

The Department of Problems and Projects aims to present each month a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration. The editors will not accept the old hackneyed problems of footstools, taborets, towel holders, etc., which have been made from time immemorial, ad nauseum.

Drawings and manuscripts should be addressed: The Editors, INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.

LAYING OUT A SUN DIAL.

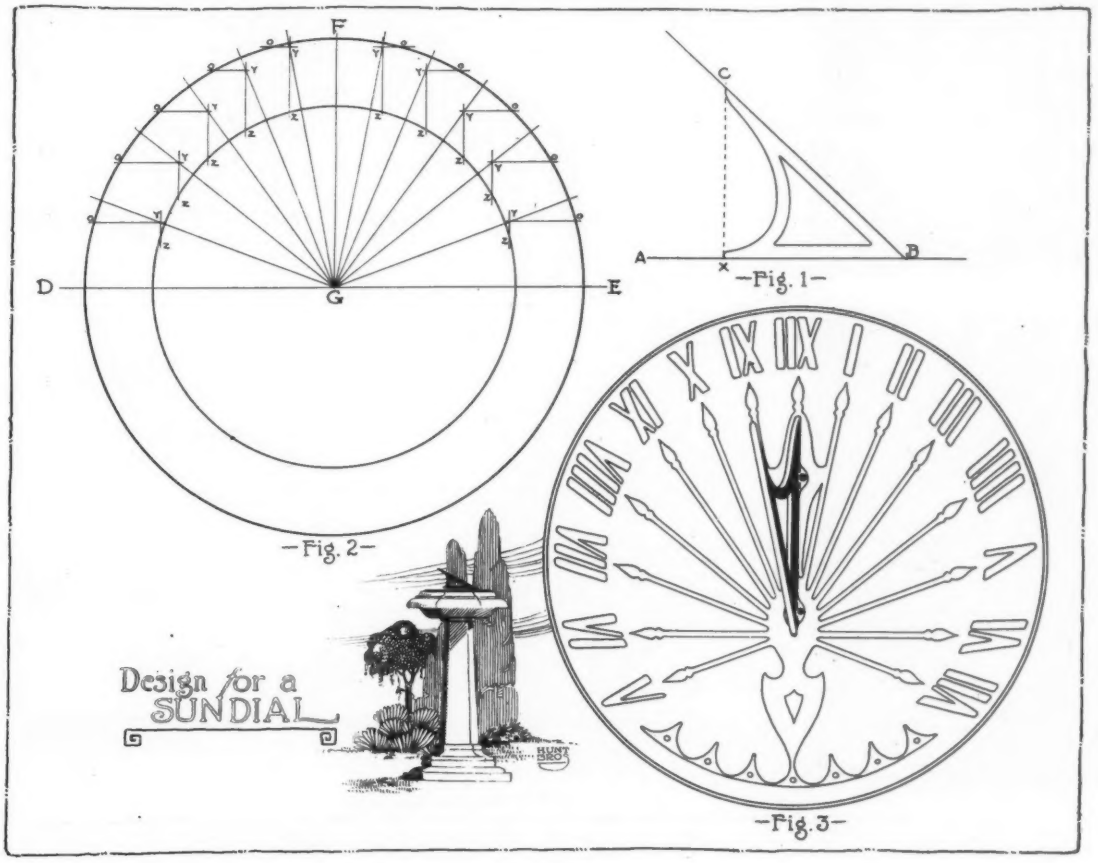
W. Ben Hunt, Milwaukee, Wis.

The writer has worked out the sun dial in the December, 1921, issue of the INDUSTRIAL-ARTS MAGAZINE, but found it rather complicated. The following method given by the late H. R. Mitchell of Philadelphia will be found more simple.

The first thing to do is to lay out the gnomen—the triangular object which serves to cast the shadow. To do this one must know the latitude of the place where the dial is to be placed. The drawings are for Milwaukee, 43 degrees north (about). Upon the base line A B describe the angle and continue it to C, a variable distance depending on the size of the gnomen desired. From C a vertical line is carried to the base line, and the gnomen is completed in its simplest form. Fig. 1. Since only the upper edge and sufficient base for support are needed, the foot can be shortened and the intermediate part cut away in any dsired design. Be sure and leave a flange wide enough at the base to fasten it to the dial proper.

The next step is to lay out the face of the dial. This is shown in Fig. 2. Draw a horizontal line D E and at its center, describe a circle the radius of which will equal the line B C in Fig. 1 (the length of the gnomen face). The points D E upon the circle will be the six o'clock points. Inside of this circle another circle should be drawn whose radius should equal the length of the base line (from B to X, Fig. 1). The two quadrants of the outer circle D to F and F to E, next divide into six equal parts o, o, o, etc. Do likewise with half of the inner circle and obtain points 2, 2, 2, etc. From each of the points o, o, o, etc., draw lines parallel to D E and from each of the points, 2, 2, 2, etc., draw lines parallel to F G. Mark points of intersection Y, Y, Y, etc., and draw lines through them from the central point G. Where these lines cross the circles will be the hour points. In drawing the figures for the hours they should have the same inclination as the lines radiating from G. The half and quarter hours should be made in the same way by dividing the inner and outer circles and drawing a line through the intersection of G. The lower half of the dial can be made by extending the line for 5 o'clock which will make the 5 o'clock for morning, and the 7 o'clock will make the 7 o'clock for evening (Fig. 3). The hour lines should be about the same width as the thickness of the gnomen.

As the hours about the middle of the day are closer together, than those early in the morning or late in the



—Fig. 1—

—Fig. 2—

—Fig. 3—

afternoon, it makes a better looking dial to shift the center towards the twelve o'clock mark and draw a circle from this point. Fig. 3 shows the complete dial with gnomen attached.

Should you wish to have something a little different from the ordinary, try working your dial in slate, but a copper or brass gnomen is recommended.

BAG HOLDER.

Louis M. Roehl, Ithaca, N. Y.

A bag holder must be so designed that it will hold any size of bag wide open and in an upright position when empty, when partly filled or entirely filled. It should be equipped with a holding device that is not ruinous to the bag and which makes it possible to remove the bag quickly and easily. The bag holder which is shown herew th is designed to hold any ordinary size of bag by virtue of the hinge on the inside of one post at the bottom which allows the post to swing inward at the top and the coil spring at the outside of the post which draws the bag open when it is placed on the holders.

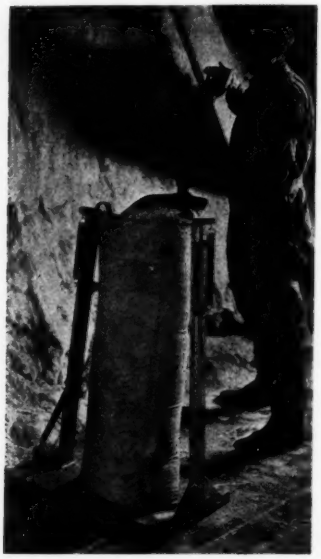
The hinged post is 39" high and the other which is mortised into the platform at the end is 40⅝" high. This places the holders 40" from the platform and thus holds the ordinary seed bag, which is the longest of the bags ordinarily used by the farmers, in an upright position when empty.

The hinged post is braced by the heavy wire which is wound once around a round head blued screw placed 8" up on the post and fastened to a screw eye at each side on the platform. The screw eyes and wire are placed directly in line with the inside edge of the post so as to remain the same plane as the post is tilted.

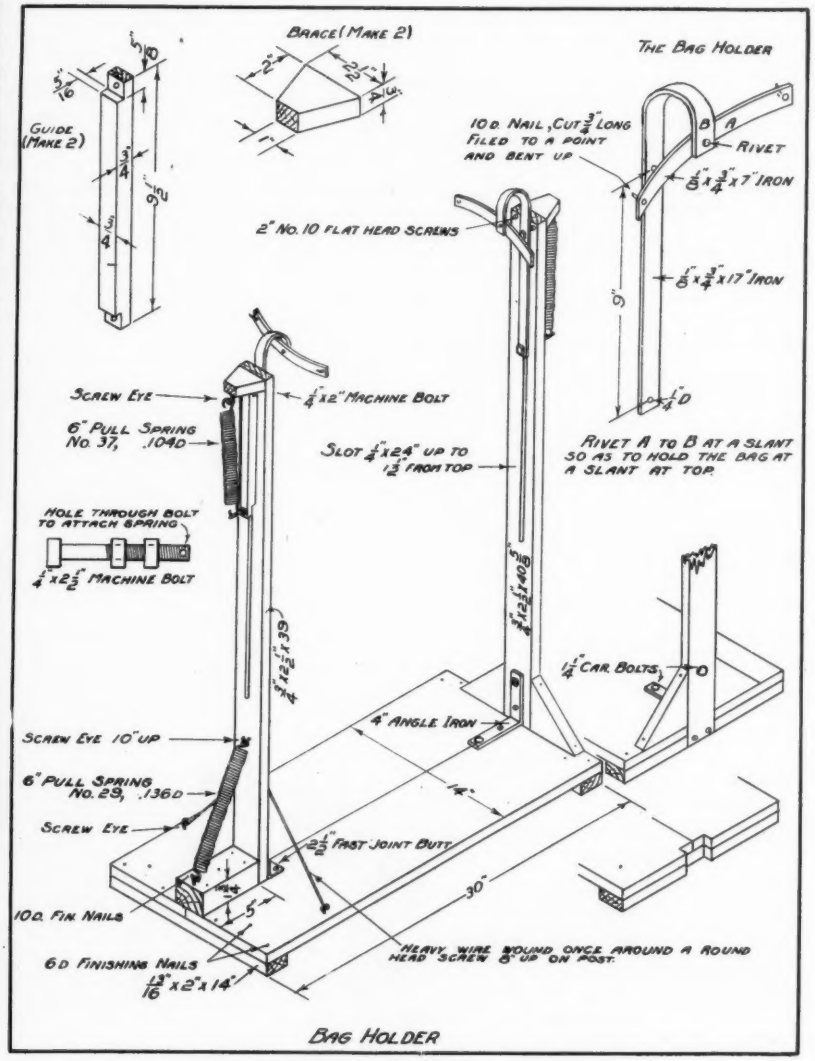
The 1¾" x 2½" x5" block prevents the hinged post from being drawn back to more than a vertical position.

The other post is fastened so as to remain rigidly upright. It is mortised into the platform as shown in the detail drawing and fastened with two 2" No. 10 flat head wood screws. It is further braced at the sides with two 4" triangular blocks which are tacked in place with finishing nails and at the inside by a 4" angle iron. The angle iron is fastened to the post and platform with two ¼" x 1¼" carriage bolts and two flat head screws placed as indicated in the drawing.

Each post has a slot through it at center ¼" wide and 24" long up to 1½" from the top. This slot allows the guides to work up and down.



THE BAG HOLDER HOLDING A SHORT WIDE AND A LONG NARROW BAG.


BRACE (MAKE 2)
THE BAG HOLDER
GUIDE (MAKE 2)
10 D. NAIL, CUT ¾" LONG FILED TO A POINT AND BENT UP
RIVET
⅛" x ¾" x 7" IRON
2" No. 10 FLAT HEAD SCREWS
⅛" x ¾" x 17" IRON
SCREW EYE
¼" x 2" MACHINE BOLT
6" PULL SPRING No. 37, .1040
SLOT ¼" x 24" UP TO 1½" FROM TOP
RIVET A TO B AT A SLANT SO AS TO HOLD THE BAG AT A SLANT AT TOP.
HOLE THROUGH BOLT TO ATTACH SPRING
¼" x 2½" MACHINE BOLT
1¼" CAR. BOLTS
4" ANGLE IRON
SCREW EYE 10" UP
6" PULL SPRING No. 29, .136 D
SCREW EYE
2½" FAST JOINT BUTT
10 D. FIN. NAILS
6 D FINISHING NAILS
HEAVY WIRE WOUND ONCE AROUND A ROUND HEAD SCREW 8" UP ON POST.
BAG HOLDER

DETAILS OF A BAG HOLDER.

Each guide consists of the metal holder, a wooden guide and two bolts. The holder, wood guide and the lower bolt are shown in the detail drawings. It should be noted that the bolts are provided with two nuts so as to lock onto the wood guide and prevent the guide from clamping to the posts and prevent free movement up and down. It should also be noted in the drawing of the lower bolt that a hole is bored through the bolt near the end and thus a means provided for attaching the lower ends of the springs.

A wooden brace is fastened to the outside of the posts at top with two 2″ No. 10 flat head wood screws. A screw eye is fastened to the under side of each brace and thus a means provided for fastening the upper ends of the springs.

The metal parts of the holder may be bent to the desired shape by holding them in a metal vise and using a wrench.

Ten d nails are used to hold the bag. They are cut ¾″ long and filed to shape and the point bent up while held in the vise. Holes are drilled through the holders of the same size as the nails and they are held in place by driving the center punch in at the point while the nail comes through the metal. As shown in the detail drawing A is fastened to B with a rivet. It is fastened at an angle so as to hold the bag at a slant at top and thus facilitate shoveling.

The following is the bill of material for the bag holder.

Lumber.

Pieces	Dimensions	Use
2	1⅛″ x 2″ x 14″	Sills (softwood)
2	1⅛″ x 7″ x 2′ 6″	Platform (softwood)
1	1¾″ x 2½″ x 5″	Brace for tilting post (softwood)
1	1⅛″ x 4″ x 4″	Triangular braces for post (softwood)
1	¾″ x 2½″ x 3′ 3″	Tilting Post (hardwood)
1	¾″ x 2½″ x 3′ 4⅝″	Post (hardwood)
2	¾″ x ¾″ x 9½″	Guides (hardwood)
2	¾″ x 2½″ x 2″	Braces (hardwood)

Hardware.

2 doz. 6d finishing nails to fasten platform to sills and triangular braces.

½ doz. 10d finishing nails to fasten brace to platform.

1 2½″ fast point butt to fasten tilting post to platform.

1 6″ pull spring No. 26 or .136 D wire for tilting post at bottom.

2 6″ pull springs No. 37 or .104 D. wire to keep holders up.

6 screw eyes.

1 ⅞″ round head blued wood screw to fasten wire brace to tilting post.

24″ heavy wire to brace tilting post.

1 4″ angle iron.

2 ¼″ x 1¼″ carriage bolts to fasten angle iron to post and platform.

2 ¼″ x 2½″ machine bolts with two nuts each for guides at bottom.

2 ¼″ x 2″ machine bolts with two nuts each for guides at top.

4 2″ No. 10 flat head wood screws to fasten braces to posts.

2 pieces of iron ⅛″ x ¾″ x 17″ upright members of the bag holder.

2 pieces of iron ⅛″ x ¾″ x 7″ for horizontal members of the bag holder.

2 ¼″ x ⅝″ iron rivets to assemble bag holder.

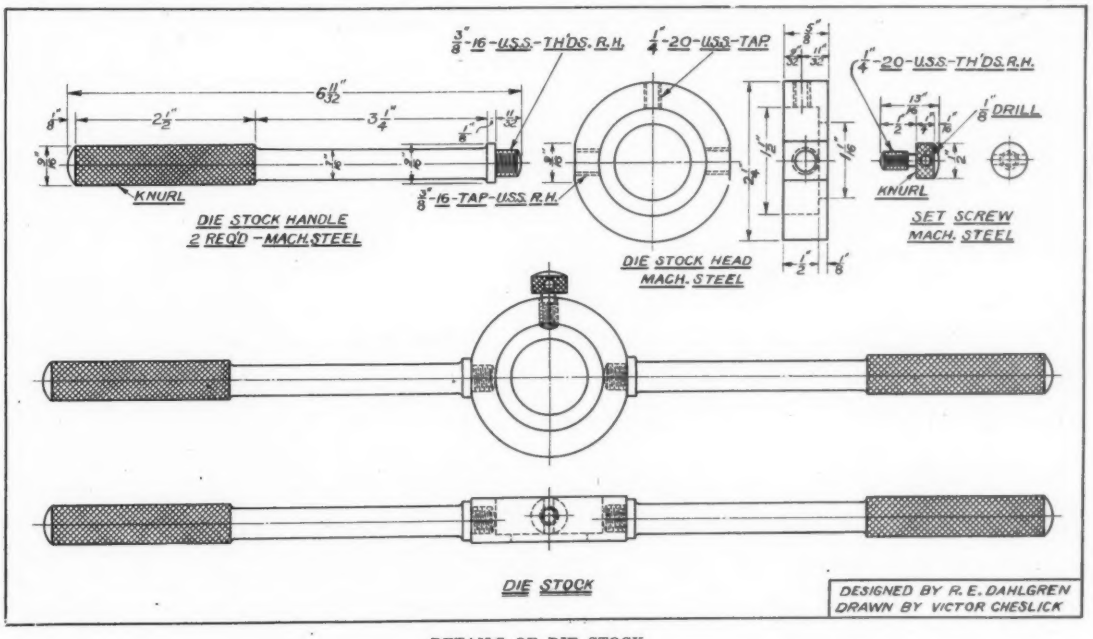
4 10d common nails to make the bag holder.

DIE STOCK.

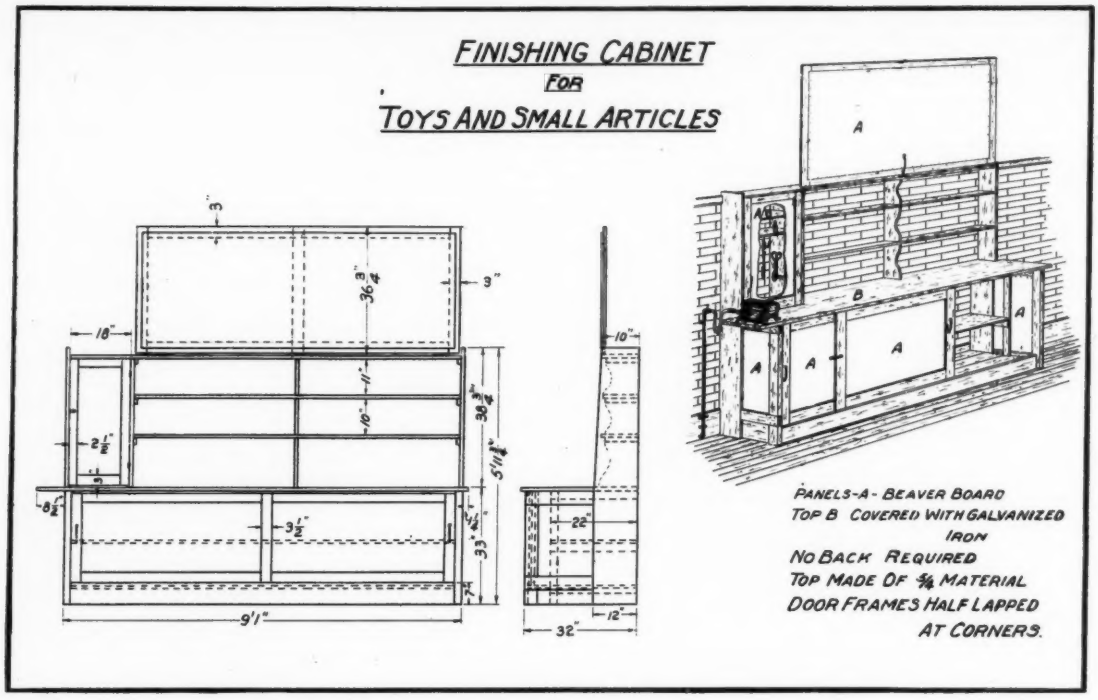
R. E. Dahlgren, Machine Shop Instructor, Racine Conuation School, Racine, Wis.

Some time ago my shop, in an emergency, had to use a die for which we had no holder. The accompanying drawing is the design which has been evolved from what was then a make shift die stock. It makes a fine tool which goes especially well with a similar tap wrench, illustrated in the "Industrial Arts Magazine" some months back.

The only part of the stock that may cause any exceptional trouble is the head. In making this, I would suggest, the facing and boring of the head first, then the periphery and the other side can be machined, either by chucking the stock from the inside, or what may prove the more satisfactory, by using a stepped arbor. Now how well the rest of the work may have been done, it can be spoiled by drilling the holes, for the handles, crooked. This can be guarded against by using tool makers' methods in laying out and drilling the holes in the drill press. A slower but a very satisfactory method which can be used is to mount the job on an arbor and do the drilling in the milling machine. At this time the



DETAILS OF DIE STOCK.



DETAILS OF FINISHING CABINET FOR SCHOOL OR HOME USE.

9/16" seats for the handles can also be faced, with an end mill, so that the shoulders on the handles will seat snuggle. It may well be said here that the strength of the die stock is materially affected by this fit.

The die stock can be left polished but I have found that case hardening it in cynide, makes a more attractive as well as a desirable tool.

FINISHING CABINET FOR TOYS AND SMALL ARTICLES.

Frank I. Solar, Detroit, Mich.

There is more or less dust caused by sweeping and cleaning in every small shop. And even where finishing rooms are provided it is quite convenient to have some place to store small articles while the finish is drying.

Other teachers are having the same difficulty as I did in keeping painted toys away from the settling dust. I have gained this information from letters received from teachers asking what kind of a scheme I used to take care of painted toys while they were drying.

This finishing cabinet serves for many purposes in my shop. It is used as a glue table, stain and paint bench, a place on which to make large layouts, and as a place where small soldering jobs are done.

This drawing does not detail every part because it is not necessary to make a cabinet exactly like this one. No doubt some dimensions will have to be changed to allow the cabinet to fit a certain space in another shop.

Any kind of material is suitable as the cabinet can be stained or painted. The top, shelves, and frames are made of wood but the panels in the doors are beaver or wall board.

The top is covered with galvanized iron. This is ideal for gluing or painting and it offers a suitable protection for the gas heater. A strong solution of gold dust, hot water and turpentine may be used for cleaning the top. The small cupboard at the end is equipped with an outfit for soldering. This is convenient as a bit of soldering is necessary now and then in the construction of toys.

A large door swings down on hinges fastened to the top of the cabinet and protects the shelves in the upper part. The lower part may be closed by sliding doors that work between cleats forming slides. There is no back in the cabinet; it is built against the wall saving considerable material. Paints and brushes can be stored on one of the shelves in the lower part.

A HANDY JIG.

J. S. Turner, Vocational Teacher, Centralia, Wash.

As all know who have worked any in a carpenter shop, it is difficult to hold and put together a mitered corner.

The jig illustrated makes it as easy as an ordinary

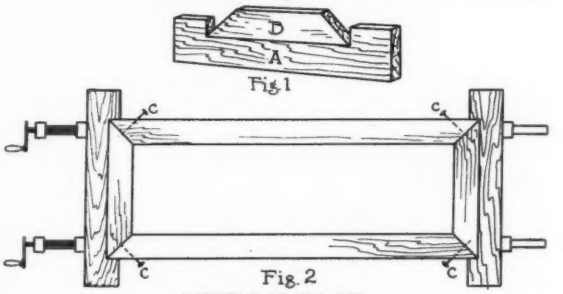


Fig. 1

Fig. 2

PICTURE FRAME JIG.

square corner and is useful when a number of pieces of the same size are to be joined.

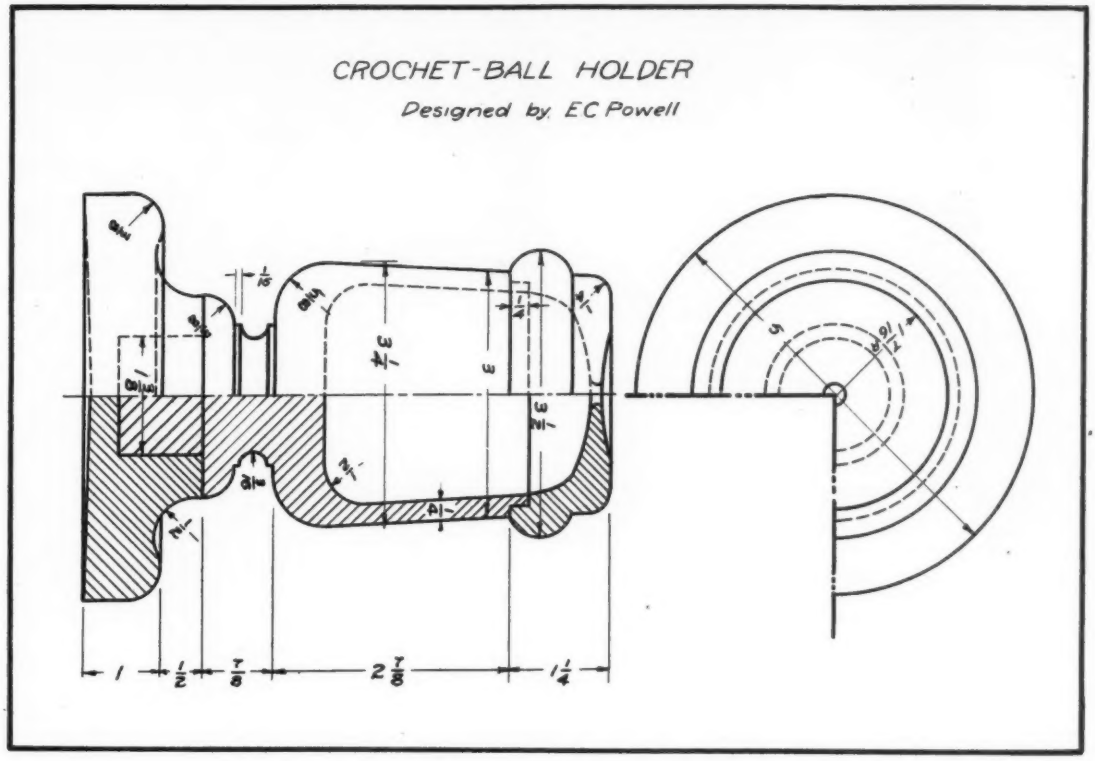
The jig is cut out of a piece of wood as shown in Figure 1 and is indented the exact length of one side of the frame. In figure 1, (a) is the jig and (b) is one side of the frame in place. Figure 2 shows the complete arrangement, with screw clamps in place.

It will be noted that the notch in the jig is only about one-half as deep as the width of the material to be put together and allows for nailing as shown at (c).

A CROCHET-BALL HOLDER.

E. C. Powell, Massillon, Ohio.

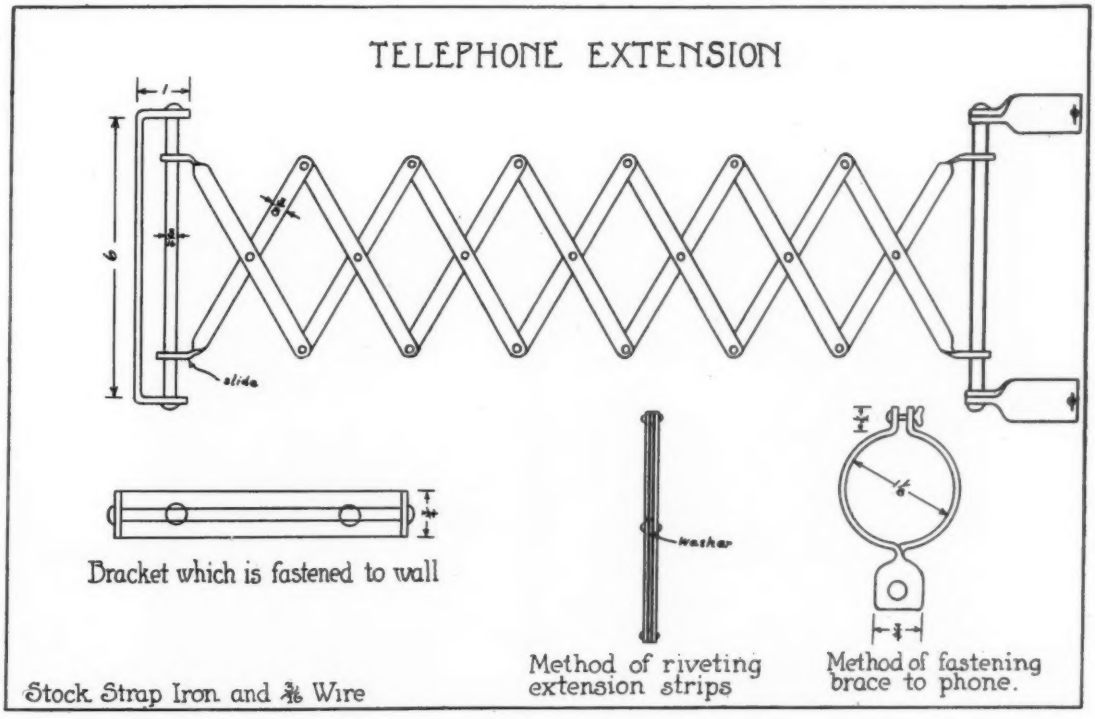
The crochet-ball holder can be turned with good results in cherry, walnut, gum, poplar or chestnut. It is designed to hold a crochet-ball in such a manner that



DETAILS FOR TURNING CROCHET BALL HOLDER.

the thread can feed out through the hole in the lid, while the ball rolls freely inside the container, but does not knot the thread or become soiled.

The body should be turned to size between centers. The base should next be turned, on a face-plate, the bottom being "dished" to make it set level.


TELEPHONE EXTENSION
slide
Bracket which is fastened to wall
Stock Strap Iron and 3/16 Wire
Method of riveting extension strips
Method of fastening brace to phone.

DETAILS OF TELEPHONE EXTENSION BRACKET.
Designed by Mr. F. D. Connard, Instructor in Manual Training, Webster Groves High School, St. Louis, Mo.

MAKING WIRELESS SETS AND LEARNING TO OPERATE THEM KEEP BOYS BUSY AT LANE TECHNICAL SCHOOL, CHICAGO.

Geo. F. Paul.

The keen interest in recent radio developments has brought about the formation of classes in this work at Lane Technical High School, Chicago, where the instruction has taken a practical form. In several of the shops and classrooms of the main Lane building boys will be found working on some piece of radio apparatus or receiving instruction in wireless operation. At the Sheldon branch of Lane many other boys are eagerly following up various features of Radio work, as they are anxious "to get into the game," as they say.

The work in the radio classes at Sheldon covers three phases of the radio art; namely, code practice, theory of construction and operation of radio apparatus and the actual construction of this apparatus. These classes are made up of boys who desire instruction in this new field of electricity in preference to the regular shop work, so the shop time is given to the radio work. The electrical course given covers two years.

The work at Sheldon is under the direction of Frederick C. Kulieke, who is a practical electrician. One of the things that he did early in the course was to draw up a table or list of all receiving apparatus, including a minimum list. This was done for two purposes: one, the study of theory; the other, the comparison of prices of purchased apparatus and that made by the boys themselves. From this list each boy decided upon the type of set of the individual pieces that he would construct. Several standard sets were designed and revision of these drawings is now in progress.

One aim in the work at Sheldon has been to have, as in the regular work, the boy make all the wood cabinets and wood parts while in his wood shop semester (the first) and then follow up with the electrical parts in his next semester.

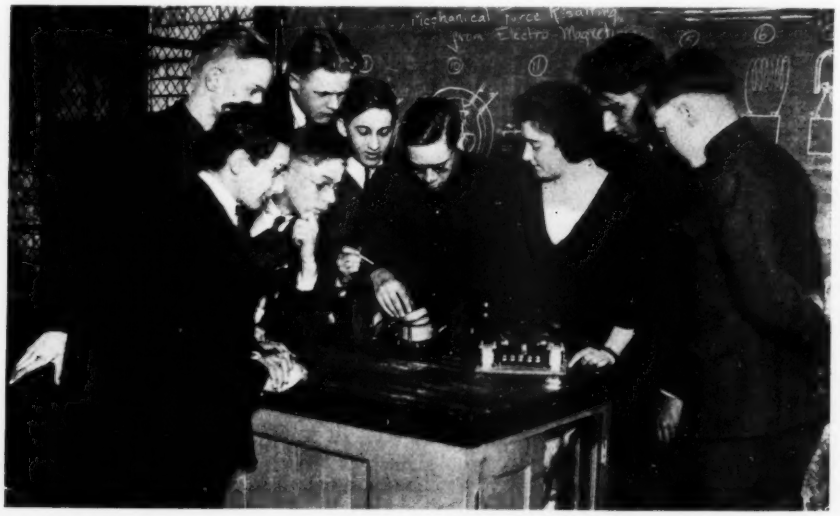
One set, in which the material used is of a cheaper character, reaches the low figure of 85 cents, and is complete, ready for 'phones, ground lead and aerial lead. One of the things the boys are making is a lightning switch for 45 cents; a switch like this, if bought retail, would cost very close to four dollars. These sets may be elaborated on, and when they are so made up they rival many of the commercial sets in looks and operation, with a saving that is certainly worth considering. Besides, and this is the really big point about it all, there is a

LOOSE COUPLERS, TRANSFORMER MADE AT SHELDON BRANCH, LANE TECHNICAL HIGH SCHOOL, CHICAGO. ALSO KEY, VARIOMETER PARTS, CRYSTAL DETECTOR, LOOSE COUPLERS.

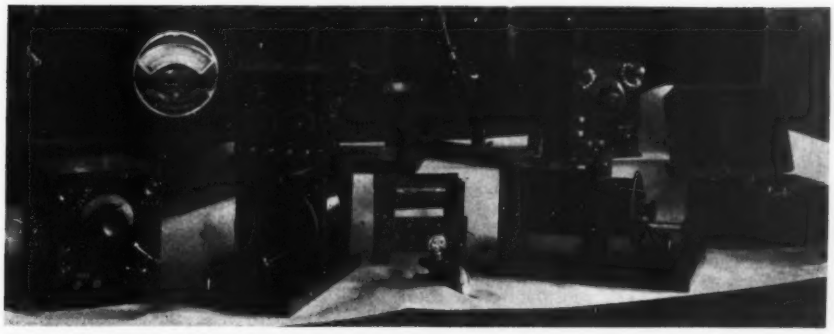
remarkably high educational value in all of this work. The boys are attracted by the mystery that is attached to the subject. It gives them the much needed hobby that offers a vent for boy activities, especially in a crowded city. Just how great this interest is among the boys may be judged from the fact that within the last three months fifteen thousand feet of aerial wire has been purchased by the boys.

In the main building at Lane, two regular classes have been established to give the boys practical training in radio operation. Instruction boards are furnished; these have 'phones and keys attached. Through the use of one board six boys can receive instruction in learning the Morse international code. The instructor is Miss Elizabeth A. Bergner, who for some time has enjoyed the distinction of being the only licensed woman wireless operator in the city of Chicago. She has found it advantageous to group the boys according to the speed they show. For example, in one group may be boys that can copy five to ten words a minute; in a second group may be those who can copy ten to fifteen words a minute; while in a third group will be the faster boys. Classroom instruction is given in the theory of wireless. Discussions are also held covering the fundamental principles.

In one of the rooms of the electrical shop on the first floor is installed the wireless cage. This station, GDB, is in operation throughout the school day. Boys from Miss Bergner's classes are on duty. There is a regular operator and one assistant every period of the school day. The regular operator is a boy who has obtained his license.



MISS ELIZABETH A. BERGNER, INSTRUCTOR IN RADIO WORK AT THE LANE TECHNICAL HIGH SCHOOL, CHICAGO, AND SOME OF HER PUPILS.



HERE ARE SHOWN SOME OF THE WIRELESS SETS AND PARTS MADE AT SHELDON BRANCH, LANE TECHNICAL HIGH SCHOOL, CHICAGO. THESE INCLUDE CRYSTAL DETECTOR SET, LOOSE COUPLERS, TRANSFORMER, LIGHTNING SWITCH, PORTABLE RECEIVING SET.

In addition to Miss Bergner's classes, considerable other work is done in the main building in the making of parts for radio sets. In this work the various shops are co-operating. Many orders have come in to Principal William J. Bogan for these parts. In producing them it was decided that there would be more general benefit to the boys if the work were divided into class projects instead of having a small and select group concentrate on this work. This plan has the advantage of giving students in different grades an active part in the work; it does not take long to change them into ardent radio "fans."

In the woodshop, where the pupils are first year boys, they are assigned work in making cabinets to hold the receiving sets. They also build cabinets for the amplifiers. The instructors aim to secure accuracy and a finished product.

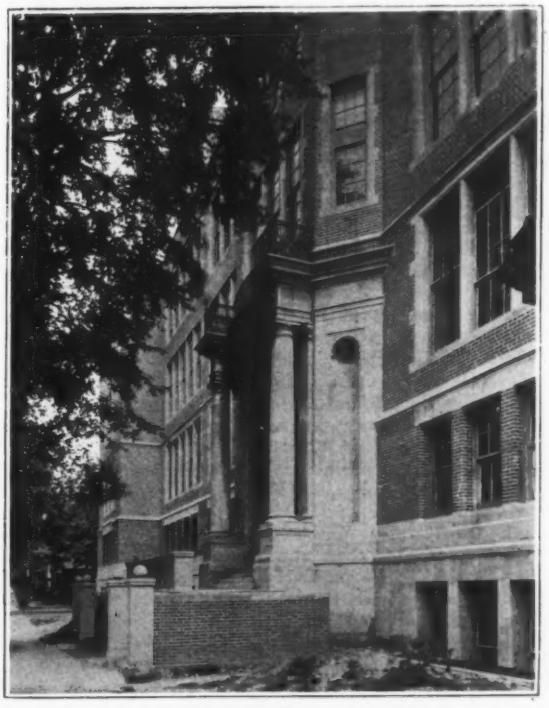
Special jigs have been made for turning out the variometer rotors and for boring out the stator blocks. In making the rotors, the stock is drilled first in a drill press. It is then faced off in a lathe to a width of three inches. Next, it is rough turned on a speed lathe, then finished and necked for the wire on a special ball turning apparatus. The stators are placed on a face plate with a special clamping device. A three-inch hole is drilled and then by the use of a special routing tool the concave spherical surface is worked out to 4¼ inches. Two of these are used in each variometer set.

The boys in the electric shop also have their work to do. This consists largely in winding and wiring variometers and in assembling the sets. It is also planned to do considerable of the engraving on the sets though up to the present little has been done in this line.

Naturally, with these varied activities, Lane has a live Radio Club. At these meetings the boys get into some warm discussions on wireless questions. There is usually some boy that thinks he knows it all, or at least a greater portion of it, and there is always an opposition that delights to take a fall out of him. Of course these discussions drive the boys to the latest radio books and magazines, for they want to keep up to date, and these discussions have a decided influence in determining their attitude toward the Radio work they are doing in the shops or classrooms. The president of the club is George Frost. He has obtained his license as an amateur and is well informed on this subject. Outside of his regular school hours he sells and installs radio sets. Various clubs and societies often send to the Lane Radio Club for a speaker.

It has taken considerable time to get the work under way at Lane, but enthusiasm counts for anything in an undertaking of this nature, then surely radio can soon be said to be firmly established at Lane. Better workmanship, improved methods, practical results,— these sum up the present policy at Lane as regards the development of Radio instruction.

DRAWING MADE BY LANE STUDENT IN LANE SKETCH CLUB.



DETAIL OF THE NEW MADISON VOCATIONAL SCHOOL, MADISON, WIS.

Western Arts Association Meets at Cincinnati

E. J. Lake

The Twenty-Eighth Annual Convention of the Western Arts Association was held at Cincinnati on May 2, 3, 4, 5. The Association was splendidly entertained by the local committee with the hearty cooperation of school and city organizations. A total enrollment of 453 members was taken by the secretary, which does not include a considerable local registration for the meetings of the session.

The larger city schools of the Middle West and many small cities and private schools were represented in the exhibitions by work which shows marked advance in design and execution over previous exhibits. The exhibits were placed in the corridors and rooms of the Ohio Mechanics Institute, and the general program sessions were held in the auditorium of that unique institution. Some sectional meetings were held at the East High School, and the Household Economics Round Table was held in the Woman's Building of the University of Cincinnati.

Inspection of the various splendid industrial and educational plants of the city were conducted by the local committees. The banquet was served in the spacious and beautiful dining room of the East High School, after which a most impressive organ recital was rendered in the auditorium. Outstanding features of the program were discussions on the Fine Arts and the Industrial Arts by Richard F. Bach, Associate in Industrial Arts of the Metropolitan Museum of New York and Dudley Crafts Watson, Director of the Milwaukee Art Institute.

Minna C. Benton, Home Economics Director, Washington, D. C., addressed the General Session and the Household Economics Round Table on topics relative to Household Arts and Economics.

Frank Leavitt, Associate Superintendent of Public Schools, Pittsburgh, surveyed the distinctions, but found little justified difference between Manual Arts and Vocational Education. His address was a strong appeal for a more thorough study of the individual student. The addresses by J. B. Biehl, Assistant Principal of the Boys' Technical High School, Milwaukee, Wis., and Howard G. Burdge, Educational Finance Inquiry, New York, stressed the need of defining the boys' and girls' individual interests and following the indications of those interests in their education. "The Education of the Abnormal Child," by Dr. Henry E. Goddard, Director of the Bureau of Juvenile Research, Columbus, O., was a most impressive address in favor of specialized school training for the abnormal child.

The exhibitions of development with a large number of children in vocal and instrumental music, by Mr. W. Ethelbert Fisher, Mr. Gustave Clemens, and Mr. A. R. Kratz, were revelations to the visiting teachers, and gave entertainment of rare educational importance to the meetings.

The newly-elected officers of the Association are:

President: H. Estelle Hayden, Supervisor of Art, Des Moines Iowa.

Vice President: G. H. Hargitt, St. Louis, Mo.

Auditor: Raymond Fell, Cincinnatti, O.

Carl T. Cotter of Cleveland, the retiring President, was elected to the Council, and L. R. Abbott was re-elected as Secretary-Treasurer.

A decision as to the place of meeting for next year awaits the conclusions of a committee which will confer with the school and civic authorities of St. Louis, Mo., to determine the facilities and conveniences of that city for the entertainment of the Association.

Methods of Teaching Prevocational Boys

A. S. Burnes, Shop-Foreman Instructor Machine Shop Practice, Guiney School, Boston, Mass.

After four years of experience and close observation as an instructor in the prevocational machine shop classes, I have come to the conclusion that the average boy, in the earliest period of his training, can be made to appreciate the importance of constructing a piece of work that will compare favorably with that offered for sale on the market. This, however, depends a great deal upon the prospective method or methods employed by the instructor. The creating and maintaining of interest in both the instructor and the pupil is the factor most desired.

My close association with instructors has convinced me that there are three distinct methods of instruction offered to the pupil: The first is used by the instructor who still insists upon giving a series of graded exercises, with the sole purpose of teaching the several operations of the trade. Since this instructor fails in placing this operation into a practical piece of work, it necessarily results in detracting his interest, and to a greater extent, which is more important, the interest of the pupil. The taking of a piece of stock and the turning of it in the lathe, until it can no longer be held for that purpose, is nothing more than a waste of the stock and of the pupil's time. The pupil quite frequently inquires of the instructor as to what this or that is to be when finished, and nothing discourages him more than telling him that it is heading for the junk pile in the form of chips.

Further on is found the second or socalled "progressive" type of instructor who insists upon disregarding the graded exercise method and confines himself to no set of rules. This method of instruction is very unsatisfactory, as the boy is very often exploited by being called upon to do an operation that is far beyond him. It is important that the student should have a good knowledge of the fundamental operations of the trade before he attempts to do something that he is likely to fall down on. On the other hand, under this method of instruction, the boy is very apt to be called upon to do an operation that he has done many times before. While repetition of work is very valuable for imparting skill and speed, yet when overdone, it becomes irksome. Repetition work can only interest the boy when he feels that he is being advanced by it.

To illustrate, a boy may be called upon to cut a taper for a nail set, to be followed by the making of a pair of centers for a lathe. This would interest as well as advance him.

Since it is important that the instructor should have some definite course of study to follow, which should be laid out in progressive order, the last named method of instruction has no place in any type of vocational school, since it fails in having anything definite or progressive.

Fortunately, however, there is the instructor who has found a happy medium between the above mentioned methods of instruction. This method of instruction is one based upon a series of graded exercises, progressive in order, and put into a practical job. There is a vast abundance of valuable education for the pupils of the prevocational machine-shop classes in the making of many tools, not only for themselves, but for the other prevocational shop classes. Such things as wood-working vises, nails sets, center punches, hammers, drills vises,

trammel points, calipers, dividers, etc. can easily be taken care of when made. The very fact is that the boy who is being taught an operation after operation in progressive order, will pay a great deal of attention when he realizes that he is to apply that operation on a practical piece of work. He has a finished product to look forward to and to that aim will he devote his best efforts.

NEW BOOKS

New Tinsmith's Helper and Pattern Book.

Hall V. Williams. Flexible, leather fabric, 12 mo., 458 pages. **The U. P. C. Book Co., New York, N. Y.**

Here is an old friend, in rejuvenated form, with a new dress of new type and some new illustrations and tables. The book is welcome and more useful than ever.

The new material covers mechanical statement of the principles of geometry and a most complete and explicit treatment of pattern cutting by the triangulation method. The book has made so important a place for itself in the daily work of so many jobbing tinsmiths that further comment seems unnecessary.

Report of Conference on Improving Foremanship. Report of a conference held at Tacoma, Wash., under the auspices of the Washington State Board of Education and the Wheeler, Osgood Company of Tacoma. The report represents the results of one of a series of conferences for the improvement of foremanship which is being carried on by the State Board for Vocational Education as a means of promoting industrial efficiency through vocational education. The work was conducted on the conference plan, by Mr. George Henry Jensen, State Supervisor of Industrial Education, assisted by Mr. C. M. Clark, employment manager of the Wheeler, Osgood Company. Among the topics taken up at the meetings were The Foreman's Place in the Development of American Industry, The Foreman's Job, Departmental and Job Analysis, Supervisory Analysis and Supervisory Value of a Job, Analysis of Carelessness on the Job, Charting Supervisory Operating Points, Keeping up Morale, Cooperation and Leadership, Safety and the Physical Condition of the Working Force, Orders, Directions, Suggestions and Training, with the final meeting devoted to a question box.

New Jersey County and State Vocational Meeting. The meetings of the Essex County and the State Vocational and Arts Association of New Jersey were held jointly on March 17 and 18, at Newark. Dr. David B. Corson and W. A. O'Leary were the speakers at the dinner, while Dr. F. S. Shepherd and E. Allen Smith spoke at the luncheon. The state organization held a general session at the Central High School.

The continuation school group of the state organization met on Saturday, March 18th. One of the general topics discussed was "Textbooks in the Continuation School," with Miss Mary E. DuBrow speaking on "English," Mr. J. J. Berilla on "Mathematics," and Mr. K.K. King on "Special Subjects." Miss Isabel Curry spoke on "Free Material and How to Make Use of It" and Mr. Paul S. Lomax talked on "Commercial Work." "Vocational Guidance was the subject of Mr. William R. Ward.

Hold Minneapolis Conference. Schoolmen's Week at the University of Minnesota during the week of April 10-15 gave impetus to a study of industrial education by providing generously for a discussion of its problems. At the Tuesday evening session, which was devoted to special industrial sections, Mr. A. F. Payne presided. Mr. J. A. Starkweather of Duluth, talked on "The Next Five Years in Industrial Education;" Mr. Geo. M. Brace, St. Paul, discussed "Methods of Testing Students for Vocational Ability;" Mr. W. P. Von Levern, of the University of Minnesota, took as his subject "Achievement, Intelligence and Aptitudes as Applied to Educational and Vocational Guidance," and Mr. W. H. Kirchner, of the University of Minnesota, talked on "Relation of Public School Drawing to College Offerings in the Subject."

On Wednesday evening, Mr. J. A. Starkweather of Duluth, presided. Mr. A. F. Benson, Minneapolis, discussed "Practical Arts in the Junior High School," and Mr. R. T. Craigo, Dunwoody Institute, Minneapolis, explained "The Teaching of Related Subjects at Dunwoody." The preliminary report of the Committee on General Industrial Training was given by John F. Friese, St. Cloud.

On Friday afternoon, before the superintendents and principals of the state, Asst. Supt. J. N. Greer, Minneapolis, spoke upon the subject "Industrial Education and the Course It Should Take in Elementary and High Schools." He was followed by Mr. Homer J. Smith, of the University of Minnesota, who discussed "The Place of General Industrial Training in the School Program."

In addition to the above sessions, there were also sectional meetings for agriculture and home economics teachers and supervisors.

Vocational Exhibit. The Evening Vocational School, at Albany, N. Y., held an exhibit in the gymnasium of the high school on March 10th, which was inspected by 4,000 persons. The exhibit gave the public a good idea of the work being done in the evening schools and should lead to a large enrollment next year.

In the cabinet making department were shown a library table with electric lamps, and a divan to match; also a cedar chest and a duck boat. In the machine shop were shown parts of a lathe built by the class. A complete tailstock screw was on display. In the mechanical and architectural drawing departments were shown full plans of a stucco house and garage; also the plans for a five horsepower steam-engine. In the cooking spaces were three tables fully set, the first representing the Puritan period, the second the Colonial and the third a modern table set for six people. On this table was everything from the soup to the dessert. The millinery and dressmaking took up most of the floor space. There was a large variety of dresses and hats, all made by the women and girls of the classes.

TOYS MADE BY PUPILS OF MR. A. W. JAMES, ROCK ISLAND, ILL.

NOW, ARE THERE ANY QUESTIONS?

This department is intended for subscribers who have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from competent authorities. Letters must invariably be signed with full name of inquirer. All questions are numbered in the order of their receipt. If an answer is desired by mail, a stamped envelope should be enclosed. The privilege of printing any reply is reserved. Address, Industrial-Arts Magazine, Milwaukee, Wis.

Finishing Problems.

276. Q:—Please write me if there has been found any practical way to stain sapwood on fumed oak articles; also how marquetry designs on "Rubbed drawings" are applied.—L. N. C.

A:—Sapwood on fumed oak may be shaded by the 50 per cent with denatured alcohol and then is shaded by adding saturated solutions of alcohol soluble Black J. and Bismark Brown Y. This shading of the shellac solutions is best accomplished by putting the color into small bottles in excess of the amount which the alcohol can dissolve. In this way any shade of red, yellow or black brown can be shaded up. An inch and a half Black China chisel brush should then be cut on a 45 or 60 degree angle, by holding this mitered edge parallel to the edge of a board. The brush can be sandpapered down to a chisel edge again through the use of sandpaper and a block. In using this brush the short bristles should be used on the darkest portion of the sap since it is obvious that the longer bristles will carry much color to the wood. It will require considerable practice to do this work carefully, especially to lay on a succession of thin coats which will be clear and free from blotchiness.

It may also be accomplished by shading the stained wood with a solution made up from water soluble Black J. Azidol Yellow Y. and Bismark Brown water soluble R. This is used exactly in the same manner and with the same equipment as for shellac shading and will require the same amount of dexterity and practice as for shellac work. Fumed oak work should not be filled and should have as thin a finish as is practicable.

Applied marquetry designs of the rubbed drawing type are essentially printed Decalcomania transfer designs printed by the Meyercord Company of Grand Rapids, Michigan, who stocked these designs and furnish full directions for their use. It would seem better judgment, however, that if marquetry work is to be taught the work should be done as in actual practice and each student be made to work out a design and inlay it within the limits of his ability.—**Ralph G. Waring.**

Ebony Finish on Birch.

278 Q·—I am building a piano bench of birch and wish to finish it jet black to match an old piano. Will you kindly advise me what to use for finish and how to apply? —L. R. C.

A:—Several methods suggest themselves as to the finish of a birch piano bench in ebony, but perhaps the most practical suggestion would be to make up a filler of Ivory Black, ground in oil, Silex and Rubbing Varnish in the proportion of one pound of Silex, one quarter pound of Ivory Black and two ounces of varnish, one tablespoon of raw linseed oil. This may be thinned to consistency of milk with a mixture of turpentine and gasoline or turpentine alone. Assuming that the work is properly sanded, it is best to prepare the hands by thoroughly rubbing them with vaseline or gear grease, especially around the finger nails, in order to prevent them from becoming very unsightly after using the black filler which should now be applied. In any work of this kind, this treatment of the hands will enable a very great portion of the coloring material to be easily wiped from them with a rag. This followed by free use of paraffin oil on another rag will enable the remainder to be easily cleaned up with a brush and Lava soap.

Filler for birch should be water thin and thoroughly rubbed in across the grain. Allow to set or almost lose the gloss of its liquid content, then use a piece of burlap to thoroughly rub in the filler. Following this a picking stick formed from maple so as to have a slim round point on one end and skew chisel on the opposite end will effectually remove any excess from beads, fillets, or carvings. After this treatment the whole should be carefully gone over with a cotton cloth free from lint. Let the filler dry forty-eight hours in a warm room, dust off and apply a well brushed coat of Pratt & Lambert's Black Effecto Auto Enamel. Let this dry three days, sand with a split 0000 paper, dust off and revarnish. Dry three days and rub out with FF pumice stone, felt pad and water. If no edges have been rubbed through and a full-bodied surface of solid black has resulted, it should be carefully washed up and dried, after which a coat of Pratt & Lambert's Clear Effecto should be used as a finishing coat. This is necessary since furniture should not be treated with a color varnish without a clear varnish, if one is to avoid soiling light dresses and clothes, especially during the summer season. The last clear coat should be carefully rubbed out and cleaned up with a good polish. Set aside to harden for at least two weeks previous to use, in order to avoid the printing of cloth which may occur from the weight and heat of the body. —**Ralph G. Waring.**

Finish for Rustic Furniture.

281. Q:—Will you please tell me what is the best finish to apply to rustic furniture after it has been put together? I had the boys in the high school, each make one piece of rustic furniture as one of their projects this year, getting their material from the hills around the school. I would like to know the best way to treat this material.—S. H.

A:—So far as I know the only practical method of treating rustic furniture consists in brushing on thoroughly a coat of material made from a good Spar Varnish, thinned one-half with turpentine. This will thoroughly penetrate all portions and prevent the absorption of moisture. It should be followed by a second coat of the same material, both coats being allowed seven days' interval. This should in no way destroy the rustic effect but rather tend to increase the softness of the browns and grays.—Ralph G. Waring

Support Industrial Education. The American Legion's Committee on Specialized Education in Hawaii has made a report to the Education Department of the Island. The committee was officially appointed by Commander J. R. Galt, to investigate the problem of extending and broadening the work of industrial education through the public schools of Hawaii. The members of the committee were chosen from each section of the island and include the following:

Frank E. Midkiff, Oahu, chairman.

West Hawaii—Samuel P. Woods, Maui, Frank A. Gibbs.

East Hawaii—F. A. Clowes.

Kauai, Frank S. Pugh.

The committee in its work, called upon the leading educators, businessmen, plantation managers and employers of labor, throughout the territory, and reached the conclusion that there was a demand for industrial education in the island. The committee also decided that there is an urgent need for legislative action if the work is to be placed upon an efficient basis.

The committee recommended that the American Legion, Department of Hawaii, create and foster a bill to extend and improve industrial education in the public schools. This bill will aim to solve the following outstanding problems in industrial education in the Hawaiian schools:

1. More emphasis on industrial education in the schools.
2. More specific industrial and agricultural training of industrial teachers at the normal school.
3. Securing and retaining of competent teachers of specialized subjects.
4. Improvement of teachers now in service.
5. Increased correlation and cooperation between the educational and industrial interests of the community.
6. Adequate number of buildings for industrial work.
7. Establishment of a territory nautical school.

In its conclusion, the committee pointed out that all of the foregoing problems will require a considerable increase in appropriations for education, but at the same time it should be considered in the nature of an investment in public welfare rather than an increase in the expenditure of public funds.

How To File A Saw

A Lesson In Outline

The only equipment necessary for filing saws consists of a clamp and files. To give the best working position, the top of the clamp should be on line with the operator's elbows.

Filing Cross-Cut Saws

The filer stands to the left of the clamp and at the point of the saw. He holds the file in the gullet of the first tooth and at a right angle to the side of the blade. Then, turning the point of file about 45 degrees toward the handle of the saw, he works in that direction against the front or the cutting-edges of those teeth set toward him (every other one).

After every alternate tooth has been filed to a uniform angle and bevel, the saw is reversed in the clamp. He proceeds to file the alternate teeth on this side, again beginning with the first tooth set towards him at the point of the saw.

It is essential that the filer place the edge of the file well into the gullet between the teeth, letting the sides of the file find their own bearing against the front and the back of the teeth. The angle of the file thereby becomes the same as that of the teeth and the original shape is maintained.

To determine the correct position in which to hold the file, select a tooth of correct shape in the saw (there are almost always some unused teeth near the handle-end) and fit the file into the gullet. Such teeth will also serve as a guide for shape and bevel.

Filing Rip Saws

A rip saw has its cutting edge at right angles to the fibre of the wood. Consequently, the rip saw should be filed straight across.

File every alternate tooth from one side, then turn the saw and, from the opposite side, file the remaining teeth.

With the exception that rip teeth are filed straight across, the process of setting and filing a hand saw for ripping, is exactly like that of filing a hand saw for cross-cutting.

This outline gives only a few of the important points in filing a saw. The Disston "Saw, Tool, and File Book" contains complete information, not only on filing saws, but on the general care and use of saws, tools, and files. Write to Department L, and a copy will be sent you without charge.

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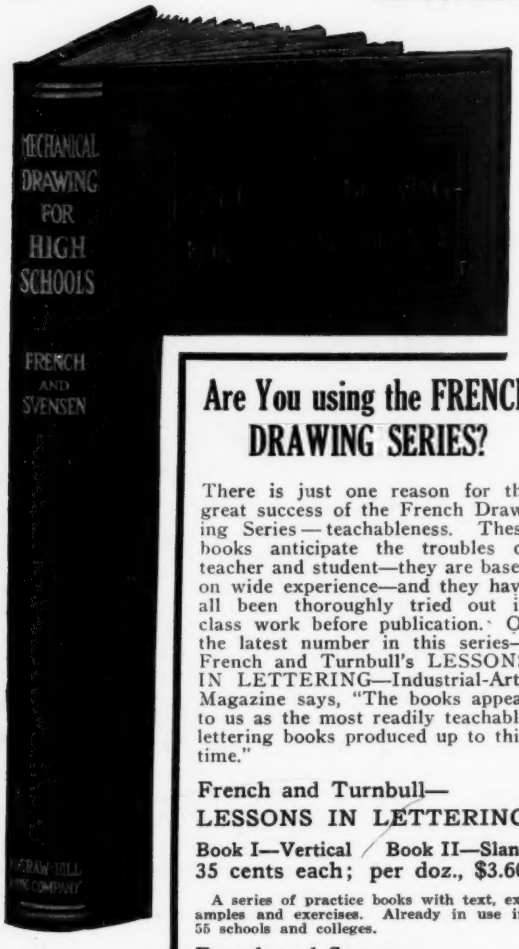
The July issue of the Industrial-Arts Magazine will explain "Why we give away books."



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BIRD HOUSE ARCHITECTURE.

To the Editors:

The May number of your valued publication has just reached me. Perhaps I am in somewhat of a critical mood as I glance through its pages, for I see some points that jar me, not because they are of great importance, but because I have noted similar points in other projects that also jar me. I refer to the whole matter of birdhouse construction, some excellent suggestions of which I find in the current issue. The one thing, possibly unimportant, I would like to suggest to Mr. Wieland and all other birdhouse architects, is that they are not building for men but for birds, and that more often human tastes predominate over bird tastes in determining the design and structural features of the project. One who is considerate of the birds would hardly make the perches of the squared sticks when birch twigs with the bark attached would be in much better bird taste, fit the feet better, and be more in keeping with the rustic design of the house.

As to the other designs, both here and elsewhere as I have observed them, the designers seem to consider that a *house*, whether made for a wren, a martin, blue bird or other animal must have the features that fit houses best for the abodes of men, even including the porches, chimneys, and other features useless to the bird dwellers. Added to this, we often see the birdhouses painted and decorated in the gayest of colors. Very well if the purpose is to build for the eye of human neighbors, but if building for the convenience of bird neighbors, why not add features that will count to the advantage of these neighbors, by offering protection against enemies, either by making the nests inaccessible and inconspicuous as the bird does in nature. Why advertise the location of the bird nest by glaring colored paints, as many do, instead of using the idea of protective coloration so nicely adjusted in many cases among both birds and their nests. Protective coloration, proper adaptation of house structure to the needs of the occupants, can well be incorporated in bird house designs without destroying their effectiveness as interesting features about the lawn or home with which they are associated.

My plea then is for more of the birdhouses that carry out the bird idea of what home should be without the intrusion of human elements that mar or even completely destroy the unity of the design and the purpose of the structure. Let us forget the idea of *house* and incorporate the idea of *nesting-place* into these bird projects as some have done in a few instances, and as Mr. Wieland started to do, but detracted from the effect by using squared perches instead of the natural twigs about the entrance.

We all need to be watchful to avoid such incongruities in our enthusiasm to do this or that thing in our shops. Let us not distort a project in order to adapt it to use as a shop exercise. It has been done too much in the past, and we have constantly to guard against such errors.

H. H. Braucher, Instructor Industrial Education, University High School, Urbana, Ill.

Day Course in Electricity. A day course in electricity has been added to the industrial courses offered by the schools of Williamsport, Pa. The work is given under the direction of Mr. Charles O. Kaupp, who has served an apprenticeship and finished a college course.

The enrollment in night courses this year is unusually heavy and trade extension classes for men are practically filled. Among the subjects offered are mechanical drawing, machine design, electricity, automobile construction, carpentry, acetylene welding, furniture drafting, machine shop practice, industrial chemistry and shop arithmetic.

Courses for women in millinery, cooking, sewing, home nursing, and dress making have been begun with students enrolled in two divisions.